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ABSTRACT

This study, using the Eisner's Educational Criticism Model, examines the role school architecture plays in eliciting creative, self-directed, child-centered responses in elementary school students. An evaluation of 11 play environments; 7 learning environments; an integrated third grade curriculum known as the City Classroom is presented; and the evolution of their design, arts criteria, and evaluation of their impact on learners are described. The relationship of the role school architectural design and art has in developing individuals' capacities to deal with change is explored. The evolution of school building and school yard design is followed from the one- room school to a contemporary elementary school to investigate why educational facilities take the form they do. A three-dimensional evaluation matrix, comprising the three axes of environment, curriculum, and human needs is proposed for assessing learning environments. Five principles of design used in this study are discussed: environment; perception; conception; diversity; and scale. A hypothetical elementary school design (the Suburban School) is proposed using the matrix with these five principles. The study concludes that children exhibit increases in both ludic and epistemic behavior when interacting with rich and varied school learning environments. (Contains 55 references.) (GR)

THE DESIGN OF LEARNING ENVIRONMENTS

by

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**A Dissertation Submitted to the Graduate Faculty
of the University of Georgia in Partial Fulfillment
of the**

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THE DESIGN OF LEARNING ENVIRONMENTS

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LAWRENCE ESTES STUECK
The Design of Learning Environments
(Under the direction of ROBERT CLEMENTS)

Over the last twenty years the researcher designed and built twenty-two diverse alternative educational facilities both inside and outside of elementary schools. The study's purpose was to determine how these environments elicited creative, self-directed, child-centered responses. Eisner's Educational Criticism Model was used to observe elementary students using the environments. Predominantly built of wood, some also incorporated cardboard, stone, canvas, steel, sand, plastic, and trees. Built by parents, students, and professional builders, they ranged in cost from \$50 to \$100,000, and in size from 150 to 25,000 square feet. They included eleven play environments, seven learning environments, and an integrated third grade curriculum know as the City Classroom. The evolution of their design, arts criteria, and evaluation of their impact on the learners is described.

The relationship of the role both play and art have in developing individuals' capacities to deal with change is explored. The evolution of school building and school yard design is followed from the one-room school to a contemporary elementary school, in order to investigate why educational facilities take the form they usually do.

To facilitate the assessment of learning environments, a three-dimensional evaluation matrix, comprised of the three axes

environmental, curriculum, and human needs, is proposed. Five principles of design used by the researcher are discussed: environment, perception, conception, diversity, and scale. Using both the matrix and these five design principles, a hypothetical elementary school design, "the Suburban School," is proposed.

Conclusions reached are that, just as Dewey wrote, environments which elicit and reinforce participation by the students and teachers are more educationally dynamic since they generate creative responses, divergent thinking, and a sense of pride. By creating and/or interacting with rich and varied school learning environments, the children exhibited increases in both ludic and epistemic behavior. These twenty-two environments involved all seven ways of knowing addressed by Eisner and were particularly influential in four of the ways: the aesthetic, psychomotor, interpersonal, and intuitive.

INDEX WORDS: Educational Criticism, Learning Environments, Outdoor Classrooms, Playgrounds, Play, Art Education, Modes of Learning, Elementary School Design.

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Illustration 1

Winterville Elementary School
Winterville, Georgia 1979

This wooden palace is the center structure in a water play environment built for kindergarten and first grade children. The arches create many angles from vertical to horizontal on which to balance. The arch, a traditional element in architecture, is seldom used in modern school buildings; its use here extends the exposure of the children to man-made forms. Towers generate imaginative play, calling forth games with castles, western forts, skyscrapers, and apartments.



CHAPTER ONE

Introduction

Over the past twenty years the author has designed and built sixty-five learning environments for elementary school age populations. This field research, along with this dissertation research, has led to the researcher's development of a system of design criteria for educational spaces. The physical dimensions of sensory experience constitute the core of these criteria. The research has focused on three elements in particular; the importance of information being transmitted three dimensionally, the need to create meaning via experiential learning, and the power of the environment to transmit messages.

Chapter One explains the research design and the evolution of the principles in the Design of Learning Environments. Elliot Eisner's evaluation method of educational criticism has been applied to the physical dimensions of the school curriculum and is used to render an image of the design principles developed over the course of this field research project.

The twenty year field research project is divided into three chronological sections: 1) Play Environments, 2) Learning Environments, and 3) Child Directed Environments. These three sections have revealed how, when creating curriculum, it is

important to consider the messages carried in the medium. Aesthetic lessons are elucidated in the structures we build, our preference is implicit in the form. The author concludes that a need exists to evaluate the physical dimensions of educational institutions.

Chapter Two reviews the literature on the effects of the environment on behavior and development. It expands on the definition of curriculum which is used throughout the paper. It presents an overview of the literature on the purpose of play and play's relationship to creativity. In an effort to identify the nature of their creation, the historical roots of our present educational facilities are presented.

Chapter Three gives examples of play environments designed by the author which illustrate the development of the principles of design for learning environments. These examples cover the author's research from 1971-1980. The relationship of the player to the environment is explored, as well as the attitudes of the educational system toward the students' happiness. Also discussed is the meaning implicit within the educational curriculum as perceived by the child.

Chapter Four, dealing with learning environments, details the evolution of the outdoor classrooms as instructional resources.

Included are discussions of seven projects:

- 1) Lofts - Clarke County, Georgia (1979)
- 2) Student built playground - Oglethorpe County, Georgia (1978)
- 3) Earthworks - Athens, Georgia (1980)
- 4) The Map - Athens, Georgia (1987)
- 5) Spacestations - I-VIII, (1988-1990)

6) The Naturescape - Atlanta, Georgia (1988)

7) The Urban Tree House - Atlanta, Georgia (1991)

Chapter Five, on the "City Classroom" environment, is a rendering of life in the City Classroom of instructor Dolly Davis during 1990, in which the third grade class designed, built, and operated a mini-city. The students assumed roles, learned of exchange, government, and city living skills. Over the course of three months, a personalized, unique classroom climate was created which addressed questions generated by the students. This documentation is a synthesis of the four City Classrooms in which the author has worked. This chapter highlights the power of self-directed, project oriented, experiential curriculum design.

Chapter Six gives conclusion of the research findings. It includes a representation of the Stueck Evaluation Matrix developed from the preceding two decades of research. This Matrix is a tool which graphically illustrates assessment of the environment. This matrix, developed by the author, has three axis: Physical Environment, Needs, and Curriculum. All aspects of learning environments can be plotted on the matrix to give an overview of their balance and tendencies. The Matrix graphically presents a model of the point at which elements of learning environments can align on the three evaluation continuums. The conceptual model generated can then be used to implement learning environments. The spirit of the child, the joy of the adult, the advantages of the physical, and the power of the place must be integrated within the facility. This model redefines the line between school and community as a permeable membrane. The lessons are integrated within the child's 24 hour

day. The teachers are considered professionals and given control over the curriculum. The entire adult community functions as teachers of the child.

Thus the six chapters of this study describe the parameters of learning environments and describe methods of implementation. The educational aspects of the 1990's which the author draws upon are founded on Dewey's educational pedagogy of 1897. Through the course of this research study they have been refined to fit the particular circumstances of each school.

Definition of Terms

The following three terms are used on the Stueck Evaluation Matrix. They are meant to encompass all aspects of the school. Where aspects admittedly overlap, the author has chosen in each case the most logical category.

Environment

The word environment is used throughout the text in reference to context. Various perspectives are generated by the vantage point taken, for example, a box in which a toy is shipped can from another vantage point become the toy itself. The building to keep the student safe and dry can from another vantage point become confining and arid. Thus we need to consider the word environment in relation to both the context and the content. To a French exchange student, America itself becomes the educational media. To the children there is no differentiation between what is educational and what is not. This perception is a cornerstone in the writings of

Dewey, Illich, McLuhan, Fuller, Eisner, and Mumford. These writers and the researcher's observations generated the first design principle: the context teaches as much as the content.

Curriculum

Curriculum as used in this paper refers to the course designed for the student to travel (Ornstein & Hunkins 1988). This includes every encounter that is arranged for their education. The term, school curriculum, must encompass both the content and the context. It is directed by the educational aims, goals and objectives which the author believes must be grounded with a view toward a sustainable future for the earth. All our short term objectives can be measured against this overarching aim.

Needs

The term, Needs, in this paper encompasses a continuum from short term to long term needs. This is further divided to expose the various vantage points of the participants in the educational system; child, teacher, administration, parent, and community. Whereas one person might see the role of the educational system ending after 190 days and on the edge of the school property, another might extend the system beyond these traditional boundaries. John Dewey in 1915 was asking why schools were empty on Saturdays, in the afternoons, and all summer. Historic preservation and natural resources in the community might become key concerns for the educational system. Examples are endless once the reader adopts the view of overlapping, alternative realities (Erickson, 1987). The term, Needs, leads us into a qualitative scale and the question of on whose reality schools will operate and evaluate.

Statement of the Problem

The architecture of the educational system is not usually designed with a set of clearly defined educational criteria in mind. Often the buyers of these facilities are principally concerned with economic and structural consideration. By using other than educational sets of priorities to frame the context of our educational system, problematic symptoms appear. These problems which have been pointed out by numerous authorities on education and will be elaborated upon in the subsequent chapters, they fall into six areas of concern:

- 1) The school climate for both the teachers and students is tedious and restrictive (Sale, 1980).
- 2) The results of a student's ten years of compulsory education are often a disappointment to the community and to the students (Wigginton, 1986).
- 3) The high school drop out rate is up to 40% of all students.
- 4) The amount of money being spent is expanding with little apparent increase in student performance.
- 5) The business community is complaining about the lack of creativity and resourcefulness among the graduates of the education system.
- 6) The system has difficulty attracting highly skilled professionals due to the working conditions and due to the low societal image of educators.

These six symptoms of systemic problems can be examined by studying the architecture of the educational system. The world of the senses, the three dimensional world, is built with direction from a societies belief system. By evaluating the effects, i.e. the physical structure, we can begin to map the causes of those structures. Each word, each brick, each child, and each action in the school system has a cause. The problem which this paper researches is what has directed those causes to be out of balance. It also explores alternative architecture and curriculum for the educational system.

The author's theoretical solution is expressed in the Stueck Evaluation Matrix (Illustration 46) which plots three aspects of school life along the x, y, and z axis. The amount of balance throughout the system can then be visualized. Three dimensional lessons available in schools can be orchestrated to balance the system. By making design decisions and operating in only a limited range of the total parameters, educational systems have created problems of both education and infrastructure. Whereas the aim of the curriculum may be to educate creative individuals, the message being absorbed by the students from the building is one of regularity, monotony, and convergent thinking. Whereas the ultimate goal of the curriculum is a diverse skilled citizenry, the course designed to achieve this diversity is often presented in a rigid one dimensional context. The design of the curriculum not only misses opportunities to teach the stated objectives, but often instigates its own problems.

Hypothesis

The major hypothesis of the research study is that children who learn in an environment designed to elicit and reinforce their development will enjoy schooling more and succeed better than children who learn in an environment designed with other criteria.

Testing this hypothesis using the principles of educational criticism requires a rendering of each situation and the reader's analysis of the cases. Validity in this method is then based on a correlation between observed reality and the written word. Working from the level expressed in the Statement of Problem, the researcher studied three aspects of the educational structure. This general level encompasses the position in which our culture places education, that is, the expectations of the entire system. The City Classrooms were built by the children, the playscapes were created to give "free play" an interesting environment, and the outdoor classrooms were created to give the content of the curriculum a three dimensional context.

Research Design

The hypothesis is investigated in several context; indoors, outdoors, playground, and integrated social studies curriculum. The research data is presented in three sections. The outdoor play environments were built between 1971-1989, the learning curriculums between 1980-1990, and the City Curriculum designs between 1980-1990. The subjects common in all treatments are the

children. The location, materials, scale, shape, form, builders, and time are variables.

Chapter 3 describes fifteen school playscapes which the author designed and built.

Chapter 4 describes seven specific play/learning environments, the author built and studied.

Chapter 5 describes the educational treatment of the City Classroom as implemented.

The method of research used in the City section will be described using Elliot Eisner's Educational Criticism method (described in detail in the next section). This is similar to Edmund Feldman's Art Criticism Technique in that it divides the explanation of a situation into a descriptive phase, an analytical phase, and an evaluation or interpretive phase. The method was developed to render a qualitative and quantitative picture of an educational situation. The observed behaviors are described using a poetic language helping the reader to imagine the process. An analysis is then given to ferret out the meaning behind the actions and determine the "reality" on which the actors were operating. Evaluations are then made as to the suitability and purposefulness of the situation.

Reliability and validity of this research method is found in how the description and analysis match the reader's observations of the situation. Art criticism is performed to help interpret a piece of art to the reader/viewer/listener. Educational criticism similarly is a vehicle employed to carry the understanding to another level. It is a lever to stand on, a vantage point to comprehend what is seen, a window into the causes behind the effects observed.

The treatments described in all cases are manipulations of the physical environment to effect behaviors. These manipulations are based on the theory that all behaviors are manifestations of the unseen thoughts and feelings of the learners, players, teachers, and designers involved. The treatments are then researched for appropriateness, effectiveness, and purposefulness. After the resulting behaviors are evaluated, the curriculum is then modified as the opportunities present themselves. The specific effects the researcher wishes to elicit with these treatment environments align with the stated objectives of the State of Georgia Curriculum Guide. These objectives are the development of balanced, productive, creative, loving citizens. The environment must afford opportunities to observe and practice these behaviors, it must both elicit and reinforce these behaviors.

Both the research treatment and the research tools are means of exposing the covert, implicit motives of the children. The research environments the author has employed are to support the development of the capacity to deal with change, to generate meaning, and to pursue happiness.

By reading the descriptions and analysis and by looking at the pictures and illustrations, the reader can form an opinion of the success of the research. In the search for meaning, culture needs freedom of expression and models of that expression. The reader can form an opinion of the validity and reliability of the environments to move the learner into productive actions.

Eisner, Illich, and Dewey often stress the importance of clarifying our goals for child development, then matching our evaluation

instruments with the empirical data to readjust our methods. How we quantify our observation of reality affects our perception of motives and behavior. The reader can follow the arguments on the developmental importance of play, then compare the educational experience available in our present facilities with the opportunities available in the facilities presented in this paper.

Eisner's Educational Criticism

Elliot Eisner over the course of two decades developed a method of evaluating educational settings which he calls Educational Criticism. This method is explained in Eisner's books, The Educational Imagination (1979) and The Art of Educational Evaluation: A Personal View (1985). Eisner defines criticism not as negative appraisal of something but rather as the illumination of something's qualities so that an appraisal of its value can be made.

It is a three step procedure of describing, then analyzing, then interpreting the effectiveness of the setting. Drawing on the fields of art criticism and qualitative research, the objective is to render a view of education which focuses on the causes and the effects. By understanding the motivations of the principal actors, the results can be better predicted.

What is significant in a social setting might have little to do with the incidence of a particular activity or statement but a lot to do with a single act or statement or with the organizational structure of the classroom or with the character of an assigned

task or with the way in which a reward is given (Eisner, 1979, p. 194).

The use of another of Eisner's terms, Educational Connoisseurship, is employed by the researcher to comprehend the subtleties of the setting. There is a distinction between criticism, which is the art of disclosure, and connoisseurship, which is the art of appreciation. Connoisseurship requires extensive exposure to and practice in observing educational settings. It is to know how to look, to see, and to appreciate what is subtle and important in a school environment.

Relating this method to the author's study, the four separate City Classrooms were observed by the author. This comprised over 500 hours of classroom participant/observer time. The 98 different students involved presented an extensive range of behaviors from which to draw observations and data. Eisner writes about observation,

To talk about essences and significance in the observation of educational events requires, of course, not only a sensitivity to the emerging qualities of classroom life, but also a set of ideas, theories, or models that enable one to distinguish the significant from the trivial and to place what one sees in an intelligible context. This process is not serial: we do not see and then assess significance; the very ideas that define educational virtue for us operate within the perceptual processes to locate among thousands of possibilities what we choose to see. The essence of perception is that it is selective; there is no value-free mode of seeing (Eisner, 1979, p. 195).

Connoisseurship provides for the critic the fundamental core of realization that gives criticism its material. The purpose of this author is to focus on the affect of the students by attending to qualities and circumstances unique to the City Classroom. A further purpose is to disclose the opportunities for creative expression inherent in the City Classroom. The criticism is not intended to translate everything in the classroom; it rather renders the situation to provide pointers to those aspects that are aesthetically, emotionally and spiritually significant.

The critical language captured by the author is illuminative of many nondiscursive forms of knowledge operating for the third grade student.

Discursive language, the type used in science and in much of our ordinary speech, is our most powerful tool for classification, but when particular qualities of life must be revealed we have to appeal to a language more intimate, or, in Langer's terms, a language that presents to our consciousness what the feeling of those qualities is (Eisner, 1979, p. 199).

Metaphorically precise statements and photographs are the central vehicles for revealing the qualitative aspects of life in the classroom. It is the author's goal to help the reader know what it feels like to be in the Bank, the Town Meeting, and the Factory. Surprise and uncontrolled variation are common place in the Classroom City, whereas, in traditional educational experimentation, they are regarded as an epistemological liability. The narrative is for the reader to have an opportunity to participate vicariously in the lives of the children, to acquire an empathic understanding of the

situations, and therefore to know them in ways that only arts can reveal. This criticism informs not by pointing to the facts to represent feeling, but rather by intimation, by using forms to present feeling.

In the interpretive aspect of criticism, ideas from the social sciences most frequently come into play. "These ideas form the conceptual maps that enable the educational critic to account for the events that have occurred and to predict some of their consequences" (Eisner, 1979, p. 207). The ideas of a hidden curriculum, peer interaction, socio-economic classifications, at-risk populations, inculturation, contextual metaphor, socio-drama, disequalibriation, and transactional analysis form vectors on those conceptual maps.

The evaluative aspect of educational criticism makes the reader aware of not only the educational values to which the author subscribes, but also of the values that are rejected. This author's values are based upon the environments created over the past eighteen years and the state of the world in 1991. The purpose of the presentation of these events is to open up the kind of discussion that educational practice should receive, but does not now usually receive. No perfect solutions have been found nor ever expect to be found. The process of education is not about solutions, rather it is about growth. Just as every form of curriculum has certain virtues and certain liabilities, so the level of discussion of curriculum can be raised with alternative examples in place.

The description, explanation and prediction of consequences of the environments presented in this research allow the establishment of empirical generalizations. These have been assembled into an

evaluation matrix to be used in the design and construction of school facilities. To secure justification for belief in qualitative forms of inquiry, Eisner gives two processes which enable educational criticism to receive consensual validation. One is called structural corroboration and the other referential adequacy.

Structural corroboration is a process of gathering data or information and using it to establish links that eventually create a whole that is supported by the bits of evidence that constitute it. Evidence is structurally corroborative when pieces of evidence validate each other, the story holds up, the pieces fit, it makes sense, the facts are consistent (Eisner, 1979, p. 215).

Interviews of the students, parents, and principles on the effects the City has on the behavior and attitudes of participants constitute evidence of many opinions. When these opinions agree, this agreement brings consistency to the statements made by the author. Unfortunately, structurally corroborated conclusions can be false, for example, nothing is so persuasive as a swindler's story. Therefore, to determine the validity of conclusions the educational critic uses referential adequacy. By checking the relationship between what a criticism says and the subject matter itself, the reader can determine the adequacy of the criticism. The goal of the evaluation is to enable the reader to experience the educational situation in a new, or adequate, way. The reader will be able to use the work to find in the school environment cues to a new perception of the power of the environment to direct behavior. There are several layers of meaning operating simultaneously in the educational settings presented (Illustration 36). Within these phenomenon dense settings, the

author focused on a particular set of things to describe, interpret, and evaluate. Eisner writes about educational criticism's variety with its attendant advantages over more straightforward assessment tools.

There is often the temptation to seek simple, clear-cut, unambiguous answers to complex problems. Having to consider alternatives, to deal with dilemmas, to resolve contradictions, to think in a complex way about complex issues may seem to be more of a challenge than some are willing to take. The seductiveness of simplicity is worth resisting. Not everything - whether we like it or not - can be punched on an IBM card (Eisner, 1979, p. 218).

Research as a Collaborative Process

In the pursuit of this study, the author has developed habits of perceptual exploration with an attendant ability to experience qualities and relationships within educational facilities. The Stueck Evaluation Matrix presented in Chapter Six is a method to graphically organize perceptual exploration. The qualities of playgrounds and classrooms were altered in many different ways to explore the effects on the children and teachers. In particular the instructional staff of Barnett Shoals Elementary School, Athens, Georgia encouraged the range of experimentation on the form of the environment. Teachers, when allowed freedom to do so, were instrumental in establishing the desired learning environment. In addition to modeling the kinds of behavior and attitudes which lead to the generation of meaning, they also rendered insightful

evaluative judgments. Attention was given to learner intentionality in the playground, outdoor classroom, and City Classroom settings. In all three settings it is typically the student who determines when, to what extent, and by what means knowledge will be acquired. The social and personal context was designed to respect individual students personal opinions and attitudes. Both Ellis (1973) and Vygotskii (1978) have shown children have a natural affinity for socialization and an inclination to attend to their internal motivations. In an open environment the mastery of the conscious awareness and skill in the manipulation of symbols can be practiced at the pace and depth of each child. It requires a major shift in thinking for educators to utilize collaborative process models in their curriculums and to relinquish the reigns of design and control to the environment and the children. The school agenda can be embraced by students when it aligns, in some aspects, with the students' agendas. Careful inventory of all aspects of school curricula, as manifest in the school facilities, can indicate where many separate agendas can possibly align.

An effort was made to establish why educational facilities and the curricula which generate them took their present form. The usefulness of happy, curious, creative students will not be argued. The means, however, for designing curriculum which elicit and reinforce these behaviors and attitudes in students is explored in the following pages.

CHAPTER TWO

The Evolution of Educational Facilities in America 1806-1991

This design of learning environments draws on the conceptual frameworks of architecture, education, and ecology. The effects of the unique vantage points of these disciplines are found woven into this research. This tapestry of three "realities" is presented in this chapter to explain the foundations of the structures presented. The advantage to this study of beginning with three disciplines is that a framework resulted from their synchronicity. It is the intent in searching for solutions to the problem not to bias the search to one discipline's vantage point. Neither enjoyment nor creativity are essential in our schools or society over the short term. They are both, however, according to a reading of history, essential to prosperity.

The literature review is divided here into three sections; school facilities, education, and play. The applicable literature on ecology is inserted within these three broad categories. It will be shown that separating educational facilities planning from education is a useful but dangerous surgery. This researcher found this very separation gives the decision making for the design of our schools to individuals who are not either by temperament or training involved with child development.

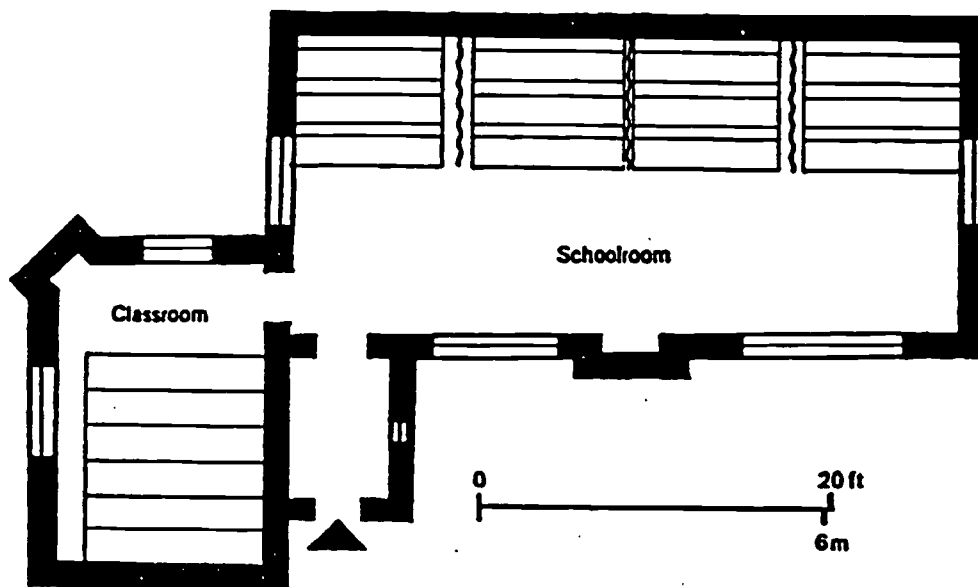


Illustration 2

Floor plan of one room school house.

The evolution of educational facilities in America 1806 - 1991

In the early years of the nineteenth century, the most typical U.S. school was the one-room school house. As the urbanization of the country evolved, so did the educational facilities. "By 1806 the Lancastrian school system of England made its debut in America. This system typically required a room fifty by one hundred feet, with rows of benches and room around the edges for the groups of ten pupils and their monitors --- five hundred students with only ten square feet per pupil" (Educational Facilities Laboratories, 1960, p.19). The one room school was simply enlarged to accomodate the urban numbers of students. By 1840, the Lancastrian school was disappearing and, gradually, the educational movement evolved toward the sorting and grouping of children by age into seven, eight,

or nine grades. Public education evolved into each grade having a separate teacher and a system of promotion from one grade to the next with a corresponding progression of subject matter. As the children became "graded", the way the entire body of knowledge was taught became divided into subjects. The amount of information was expanding, the number of disciplines exploding, and the age of specialization dawning. The educational hold of the one world/one God views of the church which tended to integrate the whole was giving way to a secular marketplace view. Graded schools required a different architectural approach and a new kind of school house architecture was worked out to meet the needs of the first fully graded, public school in the United States, the Quincy Grammar School built in Boston in 1848 described as follows:

It had four stories, the first elementary school of such a height, with a basement and an attic. The fourth floor was entirely given over to an assembly hall large enough to seat, in pewlike benches, the entire population of the school (the building accommodated 660 students). The remaining three floors were divided up into a series of separate, equal sized classrooms with a clothesroom attached to each. Each classroom was 31 by 26 feet into which were crammed 55 pupils - less than 15 square feet per child ... And so was born the prototype of the school house which, modified by progressive education, the Kindergarten, and the introduction of manual training, was carried into the twentieth century (Papke, 1966, p. 22).

The Quincy school became the standard design of elementary school buildings erected in American cities for the next one hundred

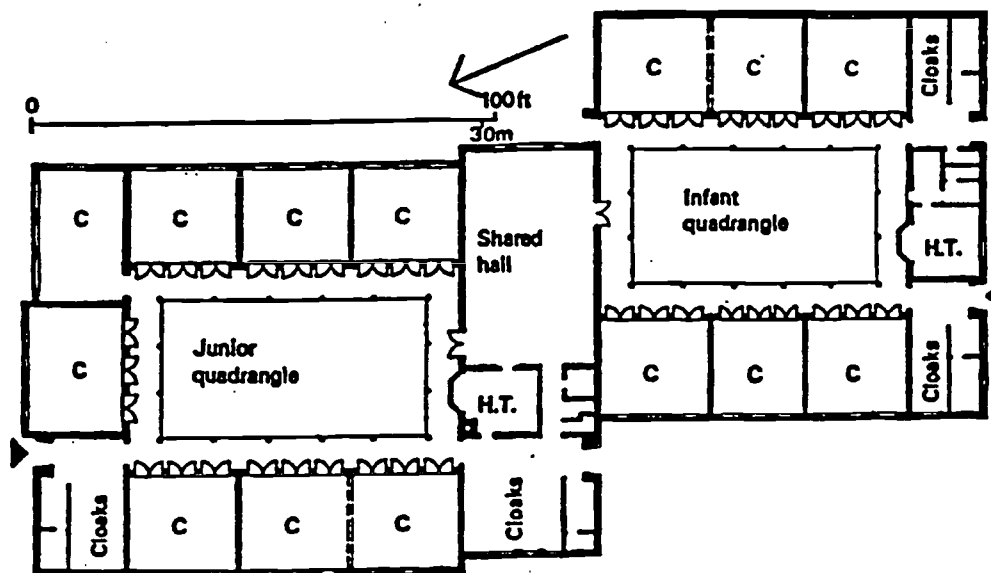
years. This standardized iconic form has overpowered all research and alternatives of school facilities through 1990. This standardization was primarily due to the fact that the Quincy design was so well adapted to the drill-and-content type of course of study which dominated the educational scene from about 1850 -1900. Pride and success has always overshadowed the problems of school construction. In its 1860 report, the Chicago Board of Education referred to Skinner Elementary School thus:

The arrangements for ingress and egress are ample; in all of the twenty rooms the light is abundant and admitted on two sides. The halls and stairways are spacious and well-lighted, and the means of ventilation seemingly perfect. In short, the whole arrangement leaves little room for improvement (Mcgraw & Buehring, 1957, p.53).

Educational theories counter to the drill-and-content type are rooted in Europe with Pestallozi and Froebel's whole child orientation; these theories were given stature in America in the early 1900's by Dewey. The emphasis on nature, student manipulation of materials and experiential learning inspired a fresh appraisal of the facilities. However, ignoring the work of Dewey and his followers, the "standard design", which has been modified today only by being one floor, had become common sense, or, as will be presented here, an underlying assumption. Change in number of students per room, addition of electricity, plumbing, and carpet are admittedly significant, yet the basic structural assumptions remain as to form and function.

The problems that did appear during this early period indicated that school plant planning problems are by no means entirely new problems. Books and articles dealing with physical plant problems date back well before the Civil War. These were detailed in William A. Alcott's, Essay on the Construct of School-houses (1830) which was awarded the 1831 prize offered by the American Institute of Instruction. Problems analyzed included size, cost, heat, light, sound, the use of space, and many of the construction and maintenance problems which also characterize the present problems in school design.

Some school design modification did occur to the omnipresent Quincy design; one of the factors that caused a design change was the influence of the Kindergarten, resulting in larger rooms and greater flexibility in facilities and furnishings. The first public Kindergarten in America was opened in 1873 in St. Louis, the trends it introduced in size and design were irreversible. Money became available in our prospering country to expand the square feet per student. By the early 1900's, the elementary school with Kindergarten rooms and tiers of uniform classrooms, assembly halls, and shops had been fashioned. The trend toward additional space per pupil and additional facilities has continued to the present. At the turn of the century the total space per pupil normally ranged from 40 to 80 square feet per/pupil and in the post W.W. II period the range was from 80 to 130 square feet. The community service concept and the playground movement added additional scope to the changing concept of the school.



Floor plan of 1936 school.

Historically, the school has not been viewed as notable architecture. Architectural historians largely passed over the schoolhouse with little or no mention of school design. The important architectural buildings for education were colleges and universities. The early history of the one-room school was not the "stuff" from which architectural history was made. Even as the dimension and scope of educational structure changed, the dimension and scope of architecture stood relatively still. The characteristic urban school became the imposing buildings which, adorned in the fashionable, ephemeral tastes of the period following the Civil War, became standard for America until the end of the 1930's. Whether their facades were Gothic, Spanish colonial, or Victorian, they were essentially a series of one-room schools, stacked up for two or three stories, to which a cavernous gymnasium and auditorium were often added along with a few other specialized spaces.

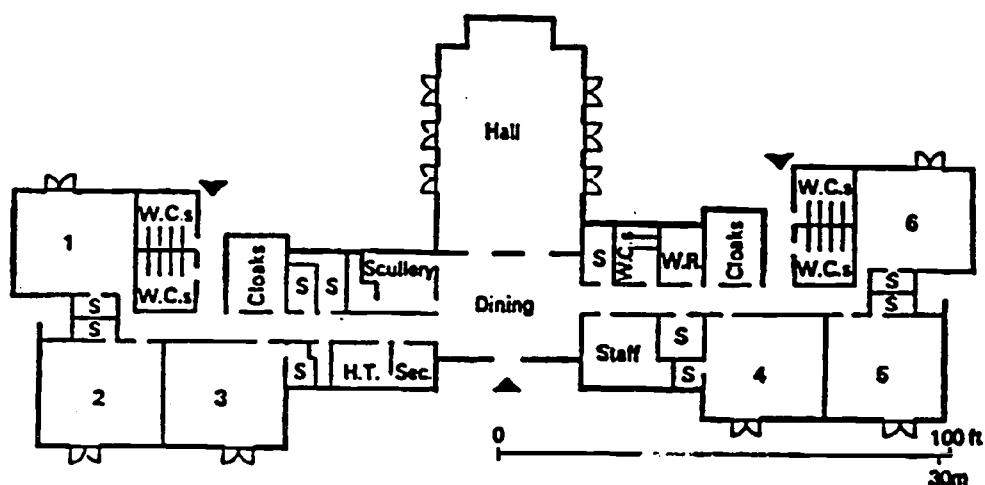


Illustration 4
Floor plan of typical 1940's - 1950's school

Despite local autonomy in school matters and few state regulations, these buildings are startling in their nationwide similarity. Improvements in such schools were substantial during the early twentieth century, particularly in health and safety factors, heating, lighting, toilet facilities, eating facilities, space per pupil, and fire safety advanced considerably, but architecture stood still.

In the 1930's and early 1940's the ornate facades often disappeared leaving a brick box with holes for windows in a style which can be described only as neuter. In the Midwest, varying social, political, and physical conditions, including the great Chicago fire of 1871, fostered change resulting in a new and meaningful architecture. The engineer, no traditionalist, made use of the new technology to build quickly, cheaply, and efficiently.

The famous "Chicago School" of architects (Richardson, Wright, Sullivan, and others) made significant advances. Challenged by America's industrial progress, they made use of the vast improvements in equipment, materials, and processes which were the products of industrial building. Their architecture poised not an applied beauty, but an innate beauty that represented the spirit of the times.

The Chicago School did much for school architecture - - it wedded common sense and creativeness to school building. Some of today's outstanding school buildings are the outgrowth of schools constructed right after the turn of the century. Bilateral and even trilateral lighting (often considered modern techniques) were, in fact, used by these men. While American architecture in general retrogressed somewhat after the first advances of the Chicago School, school architecture drifted backwards for an even longer time. From 1915 to 1940, progress in school planning ebbed, curtailed by the enactment of restrictive codes and regulations (Caudill, 1957, p. 153).

The last noteworthy movement in the advance toward modern school architecture was triggered by the famous Crow Island School in 1940, but did not gain much momentum until 1950. It finally had been shown to school architects that their real client was the pupil, and at last architects and educators began to work together to solve their common problems. The Guide for Planning School Plants (1949) was followed closely in the design of the notable elementary school in Webster Groves, Missouri, which this author attended as a child. Long halls with rows of rooms, coat closets and a wall of

windows in each room, a lunchroom, gym, and office. The floor plan shown here was typical of the elementary schools in America from the 1940's-1960's.

The National Council on Schoolhouse Construction was by the 1950's beginning to take the best ideas from around the country and turn them into State Codes. Eight of the thirteen elementary schools in Clarke County were built after this edition of the Guide was printed. The following quote shows the Council's understanding of the connection between education and bricks.

The building, its' site, and its' equipment comprise the educational plant - in essence, a basic part of the total environment in which directed learning experiences are carried on. The educational plant is a means to an end. It's major contribution is to help create an environment which is most advantageous to the success of each child in accomplishing the desired learning outcome planned in the program of instruction. The plant, therefore, has an important role to play in the educational process. If the plant is to reflect the educational hopes and aspirations of the people of any specific school community, the determination of the educational plan which describes the learning outcomes and learning environment must precede the architectural plan and the designing of the facility (1967, page 1).

With the stated goal of increasing aesthetic awareness and creativity education, plus developing self direction and an ecological value system within the community, the educational plan was studied by this researcher. The architectural plans as constructed in

these thirteen schools were found to follow only some of the goals in the educational plans. The 1960's-1990's saw many buildings with a pod design, or courtyard design, as shown in the following floor plan.

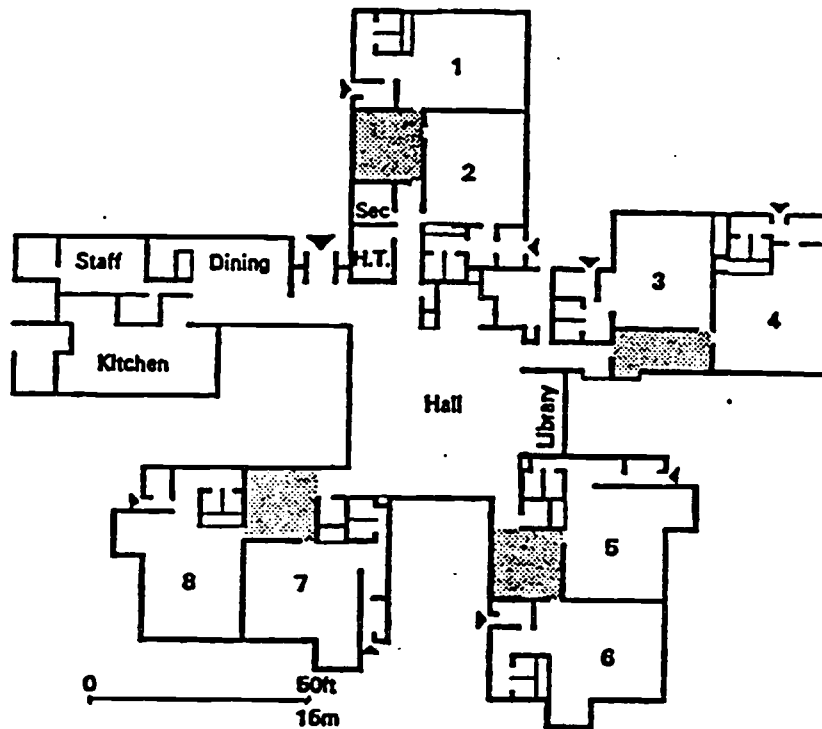


Illustration 5

Floor plan of pod design 1960's - 1990's

The comprehensive education plan which is essential to the planning of school plants consists of a series of subplans, including the five areas listed below:

- 1) The Curriculum Plan: This expands and clarifies the mission by stating what knowledge, understanding, attitudes, skills, and habits of life should be developed in the experiences of the children.

2) **The Operations Plan:** The design and conduct of the teaching and the learning activities should be based upon the agreement of officials and teachers about principles of learning, mental health, and child growth and development that will be used as the children and teachers work together.

3) **The Instructional Plan:** The desired learning outcomes are programmed across all areas of the school's responsibility, academic and nonacademic throughout all grade levels, into teaching-learning activities appropriate to the developmental needs of the children, and through which the mission of the school will be accomplished.

4) **The Organization Plan:** This is concerned with the pattern or system adopted to promote instructional missions, i.e. the form of the building.

5) **The Evaluation Plan:** This is the means by which the school staff and patrons assess the accomplishment of the school's mission. This subplan should outline clearly what instruments, techniques, and points of view are to be employed in evaluating the progress of every child and every professional staff member implementing the Instruction Plan.

What was proposed, constructed, and researched by this author were alternative instructional plans, evaluation plans, organizational plans and curriculum plans. These will be presented in Chapters Three, Four, and Five.

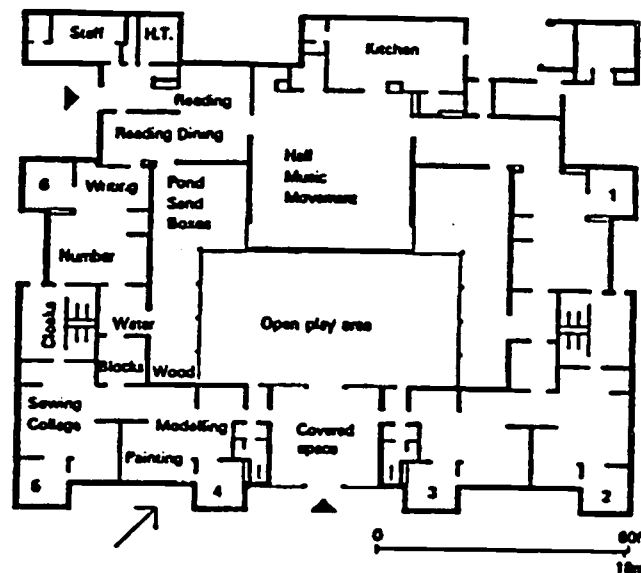


Illustration 6

Open Classroom design school

"School plants promote and facilitate, or limit and obstruct, effective learning and teaching" (Papke, 1964, p.19). The educational implications are of prime concern to all consumers of educational services. For most school systems, about seventy per cent of the school budget is devoted to teacher salaries, about half of the remaining thirty percent is allocated to the provision of plant facilities. The architect is recognized as possessing the specialized competencies necessary for planning for the construction program and the school authorities are recognized as the spokesmen for the interpretation of the community's educational wants and needs. In the period since World War II, the educational changes have altered

Illustration 7
Clarke County Elementary School
Athens, Georgia 1990
Floor Plan

Three identical elementary schools were built using this plan. Note the extensive office complex to house the expanded administration. The classroom space and shape is identical to the 1936 plan shown in illustration 3. No outside access from the classroom limits curriculum options. No flexibility of room size also limits curriculum options. Unfortunately, the researcher found the open courts shown are paved heat- and sound-collectors. The researcher built two play/learning environment for each of these schools. The Spacestation (Illustration 34) for the K-1-2 grades and the Naturescape (Illustration 33) for the 3-4-5 grades.

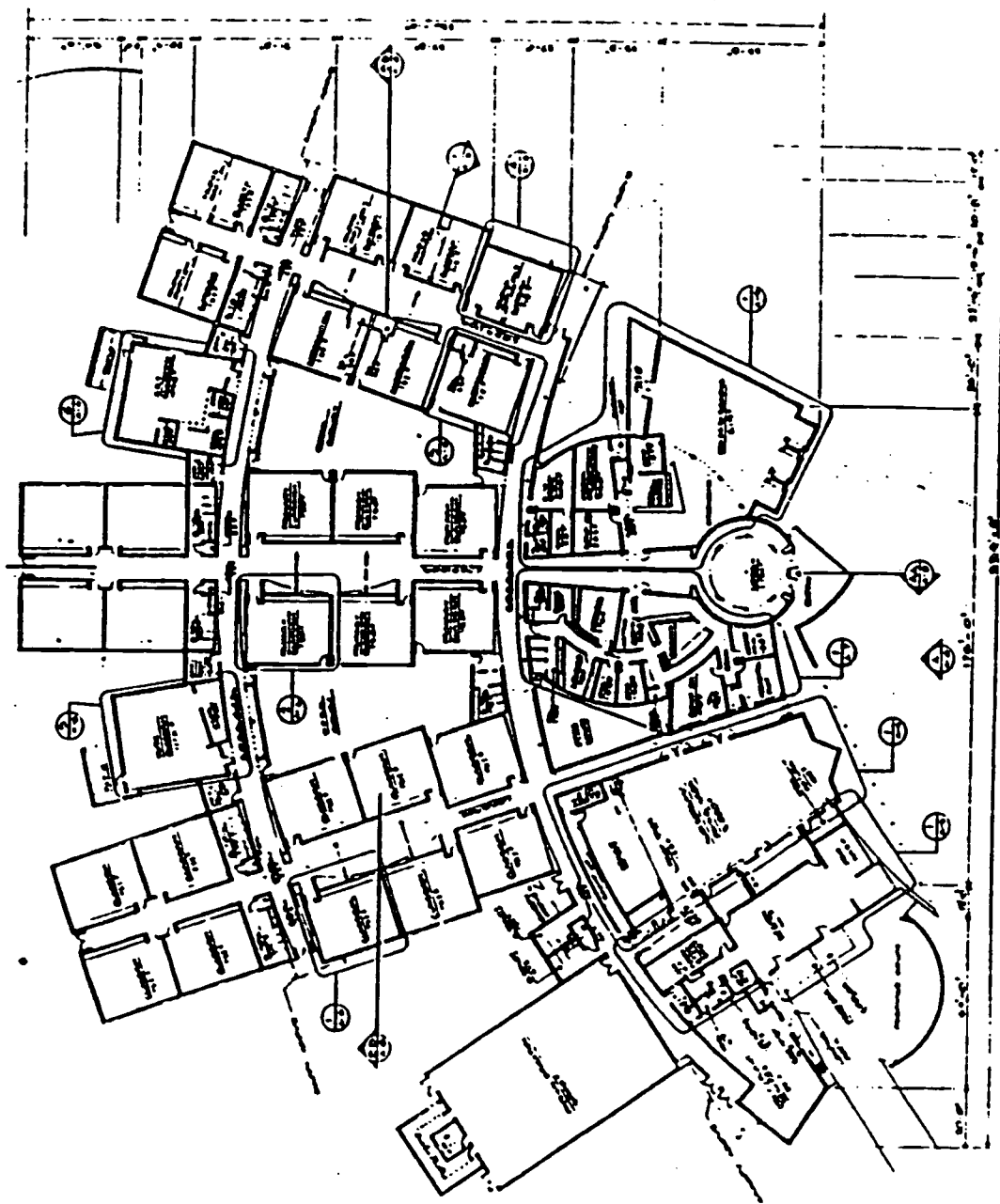
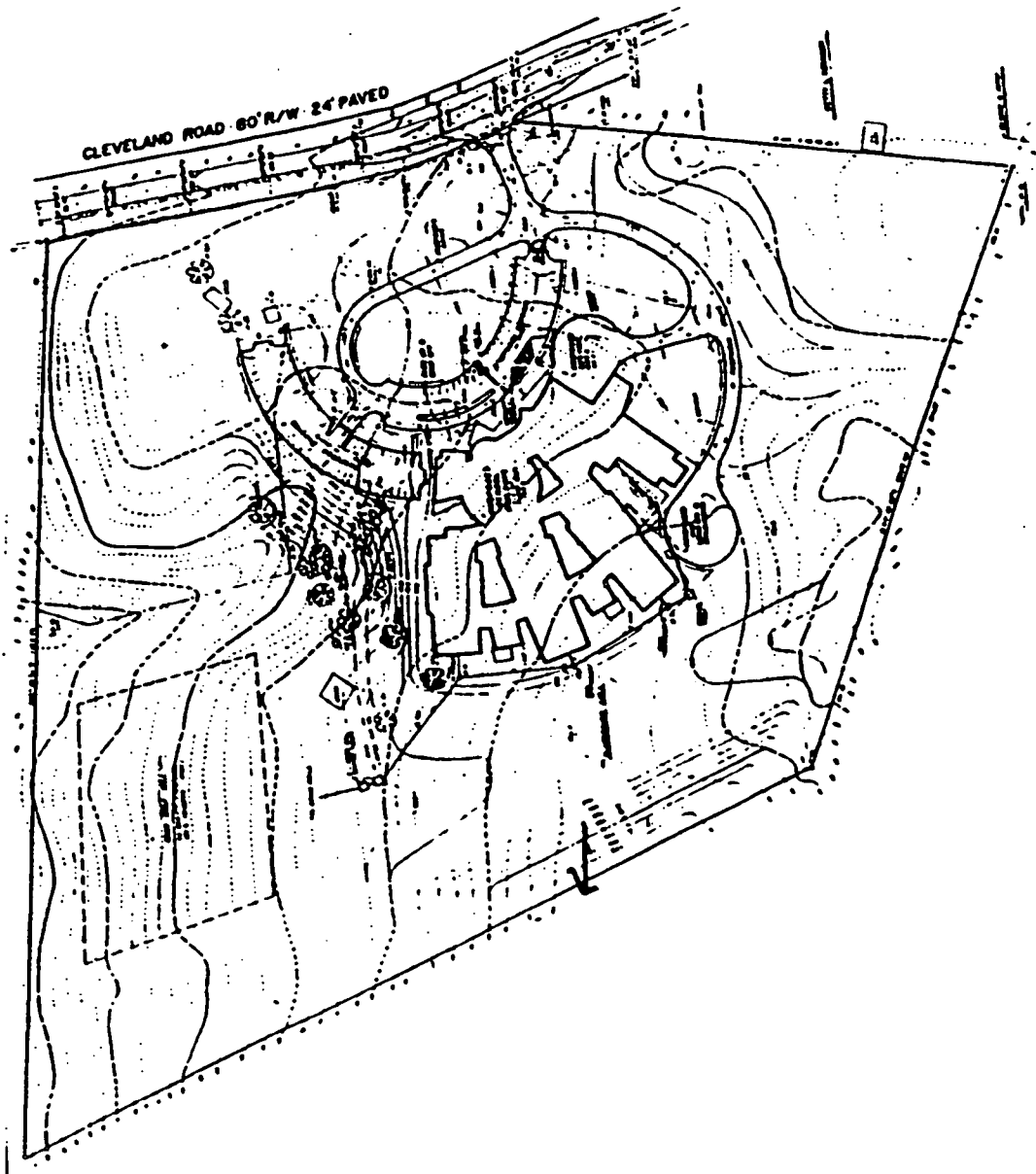


Illustration 8
Cleveland Road Elementary School
Athens, Georgia 1990
Site Plan

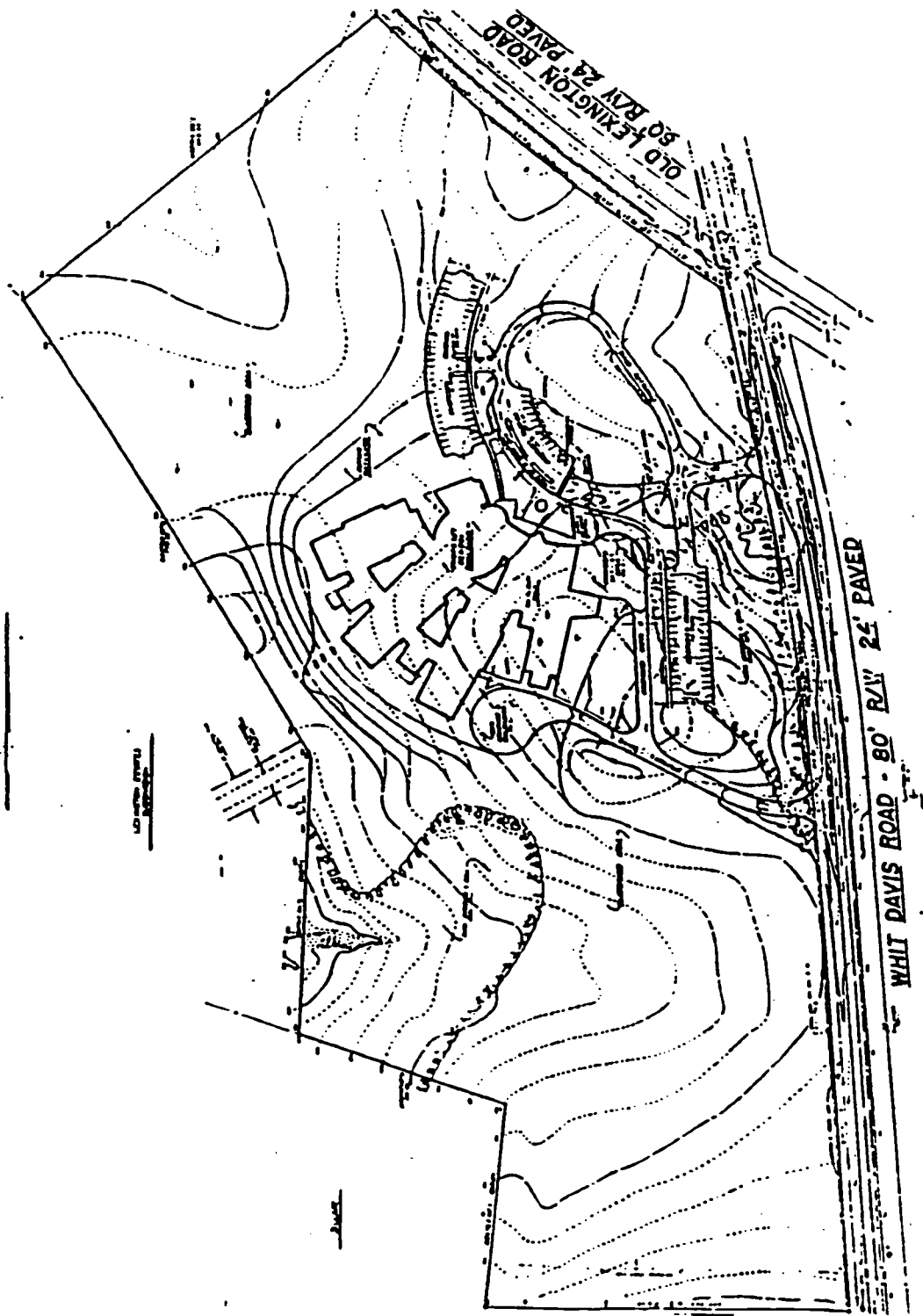
In an effort to save money and speed completion, the school board decided to build three identical schools. This decision also avoided any problems which might arise as to favoritism of one part of the county over another due to inequities between designs. The following three illustrations show how the buildings are located on their sites. Note the seemingly arbitrary orientation of the front door to the street and the orientation of the building to the sun.



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Illustration 9
Whit Davis Elementary School
Athens, Georgia 1990
Site Plan

Important information can be gained by studying site plans as to the school board's use of the total educational site, in this case 28.9 Acres. The buildings fit to the sites in these three cases was simply a bulldozer job of clearing a large enough level pad. The sun angles, views, and elevations were considered secondary. The message to the children about societies use and impact on the environment is thus built into the entire educational facility. The parking lots in front of the building and the big bright green dumpsters add to the large institutional feel of the space.



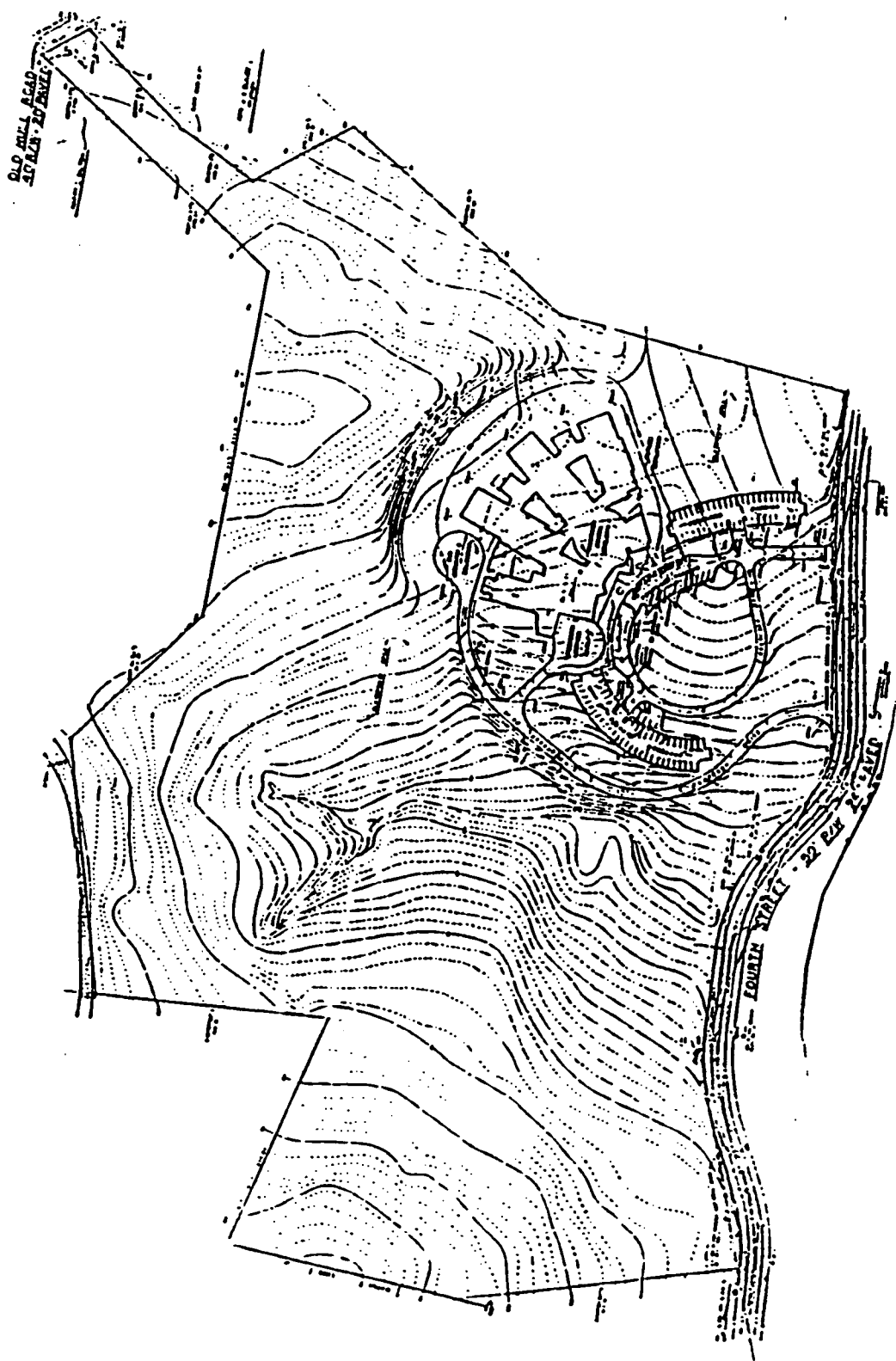
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Illustration 10
Fourth Street Elementary School
Athens, Georgia 1990
Site Plan

Here we see 65,834 square feet of building on one corner of 46.4 Acres. The 500 + children are grouped densely for administrative ease. A tremendous amount of excavation and fill were required to make the proto type school fit this site. Ironically it is this researcher's opinion that the building looks best on this site once the flat pad was blasted out of the hill. Only a handful of children walk to these monolithic schools, note the accommodation for bus pick-up at the rear and car pick-up in front. Designed to be driven to, the use of the facilities by the children is controlled by adult schedules.



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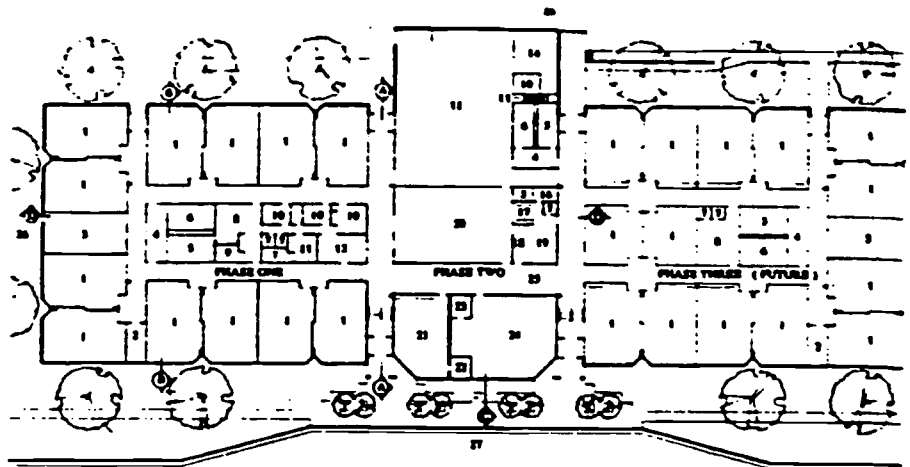
school architecture very little (Note the preceeding floor and site plans for the three new 1990 elementary schools in Clarke County). Research conducted by educators with respect to school plant design has generally ignored related research by architects and persons in associated technical fields. Conversely, there has been little effort by architects to relate to or build on the findings of research by educators. Hence, it appears that there may exist an unwarranted lack of coordination and a possible dissipation of resources due to the difference in conceptual frameworks of the two groups. The findings of both groups, the architects and the educators, are overshadowed by the power of the purse which schoolboards hold over school design. These same schoolboards are predisposed not to experiment with new forms, as can be witnessed by a review of the award winning American Elementary Schools (The American School and University, 1989)

A need exists to integrate the human factors -- social, psychological, and educational, as well as the physical factors - thermal, visual, and sonic into school plant research. There is very little conceptual research available in school plant planning in the field of education or in school plant planning in architecture.

In his 1964 dissertation Papke contended school plant research was in the state of insularity which characterized education generally and educational administration specifically. Papke emphasized the utilization of pertinent research in the behavioral sciences to illuminate educational problems. There is little commonality between research reports related to educational facilities planning in the educational, architectural, or behavioral science literature.

Illustration 11
Award Winning Elementary School Designs
The American School and University 1989

These two typical award winners show the national trend toward elementary schools of more than 600 children, a trend this researcher feels is regrettable. The differences in school layout and shape between parts of the country are negligible. They both show the ongoing preference for rows of rectangular rooms down long halls. The aesthetic messages inherently given by these designs to the children contradicts those values taught in ecology and art. The opportunities lost to expose the students everyday to a range of architecture, rich beautiful gardens, and a diversity of materials while in school, is unfortunate. Even worse is the fact that the static environments the children are exposed to give the message that brick and concrete block buildings are society's number one choice.



Clearwater Elementary School West Clearwater, Kansas

Capacity: 300
Space/student: 108 sq. ft.
Area: 32,565 sq. ft.
Total cost: \$1.6 million
Cost/square foot: \$49
Completion: June, 1989

- FLOOR PLAN**
- | | |
|----------------------|-----------------|
| 1 Classrooms | 15 Up to Mech. |
| 2 Janitor | 16 Parity |
| 3 Mechanical | 17 Dishwashing |
| 4 Washroom | 18 Serving Line |
| 5 Boys Toilet | 19 Kitchen |
| 6 Girls Toilet | 20 Lunchroom |
| 7 Staff Toilet | 21 Music |
| 8 Staff Work Room | 22 Instrument |
| 9 Paper Storage | 23 Audiovisual |
| 10 Office | 24 Library |
| 11 Health Room | 25 Commons |
| 12 Secretary Waiting | 26 Outside Ea. |
| 13 Gymnasium | 27 Bus Loop |
| 14 Gym Storage | |

Maple Hill Elementary School Naugatuck, Connecticut

Capacity: 600
Space/student: 123 sq. ft.
Area: 74,000 sq. ft.
Total cost: \$9.6 million
Cost/square foot: \$98
Completion: July, 1989

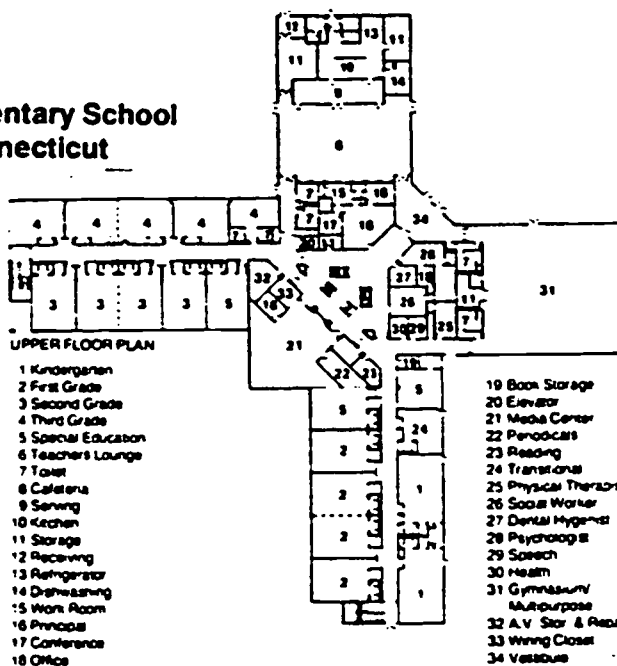
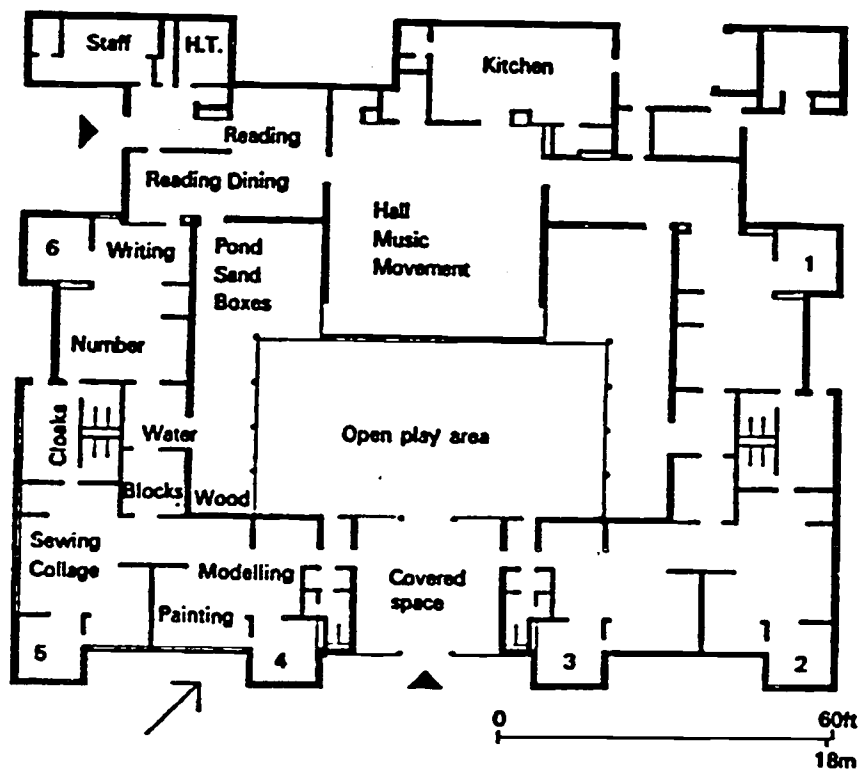
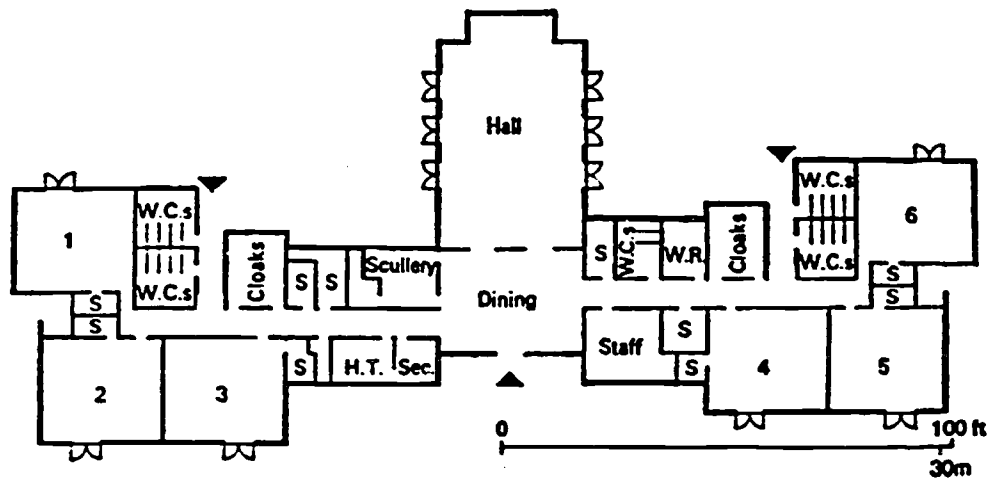


Illustration 12
Comparison of Long Hall School Design with
Open Classroom School Design

The building can aid or constrict the curriculum. Here we see two small school buildings each with six classrooms, with a maximum of 180 children. The space has been divided very differently as has the relationships within the spaces. The relative importance of activities is concretely revealed to the children by the spaces provided. The flexibility of movement and activity options between the designs is also very different. Note the covered secure play areas in the lower illustration. The amount of wall space, storage space, windows, and room height, and access to the outdoors also dictate curriculum decisions.



Not having common paradigms, the net result in buildings built is a tendency toward a default setting where local schoolboards dictate school architectural decisions based primarily design incumbency. The plan for this review of the school facilities field was based on the premise that the major relevant design criteria would be embodied in the physical structure of the existing school facilities. Reviewing the literature of architectural guides and educational plans exposes the gulf between curriculum goals and facilities.

Educational Literature

The educational literature which has directed school curriculum and thus facilities design is as diverse as the spread between the engineer's goals of efficiency and the architects goals of elaboration. This diverse literature generated from theory, research, and practice has impacted the architectural form schools have taken. By comparing the long hall design with the open classroom design the range of possibilities is seen.

Dewey wrote,

And anybody who hasn't put his soul to sleep with the apologetics of soporific "idealism" knows that at the present time the power which would fix the ends to which the masses would be habituated is the economic class which has a selfish interest in the exercise of control. To cater to this class by much talk of the importance of discipline, obedience, habituation, and by depreciation of initiative and creative thought as socially dangerous, may be a quick path to favor. But it represents an

ignobility of spirit which is peculiarly out of place in an educator, who above all others is called upon to keep his supreme interest sensitively human (Dewey, 1940, p. 141).

Unfortunately there is much in the tradition of education which lends itself, unwittingly, to such ignobility of spirit. Educational administration inherited a basic error from the older political science, and has too often devoted itself to a pompous dressing-out of solutions of a problem resting upon a "fact" which isn't a fact. It has taken as a problem how individuals who are (supposedly) non-social become socialized, how social control becomes effective among individuals who are naturally hostile to society. The basic supposition is, of course, mythological. Docility, desire for direction, and love for protective control are stronger original traits of human nature than is insubordination or originality. The scales are always weighted in favor of habituation and against reflective thought. Routine is so easy as to be "natural", and initiative is so difficult as to require the severe discipline of art. An educational problem based on a mistaken "fact" is that individuals come into this world empty-headed and need the schools to show them the way. Steiner (1927) and Dewey (1915) took great lengths to disprove this myth. They felt that if one took pains to acquaint oneself with the spiritual and scientific methods of gaining insight into human nature and applied oneself with sympathy to understanding it in its immense diversity, one might be able to work from the inside to release potentialities instead of from the outside to impose conventionalities.

The importance of the school curriculum which relates to the child's world of today, is advocated often in the literature. Dewey wrote,

...the urgent need for the particular kind of social direction fitted to a democratic society - the direction which comes from heightened emotional appreciation of common interests and from man's understanding of social responsibilities, an understanding to be secured only by experimental and personal participation in the conduct of common affairs" (Dewey, 1940, p.142)

Rapid transportation and communication have compelled people to live as members of an extensive and mainly unseen society. In 1964, McLuhan coined the term "Global Village" to describe this web. The self-centered locality has been invaded and largely destroyed. Forces beyond Education's and Architecture's traditional focuses have altered the mission of the schools. The introduction of a global ecological consciousness, a world market place, and mutual assured destructive capabilities has in the last 27 years closed that unseen society even more.

Thomas Jefferson's desire in 1800 for universal education as a necessary condition for democracy is a foundation of public education in America. The Lancastrian school system, and the graded school system use the drill method of instruction. The trend toward instruction, away from education, is fueled by the tools of evaluation, standardized scan test, and is adopted to handle the great number of children today. A second cause for instruction is persistence in the body of what is taught, traditional material which

is irrelevant to present conditions. The subject matter of instruction, which though valuable in some past period, is so remote from the perplexities and issues of present life that its mastery affords no resource for discriminating insight, no protection against compounding the emergencies of today. A third cause of instruction is today's curriculum consists in a systematic, almost deliberate, avoidance of the spirit of criticism in dealing with history, politics and economics. How much has changed in our political, economic, social, and spiritual life since the time of Jefferson and Dewey? What would they say about the Georgia educational system's effectiveness today? Our economic and political environment leads us to think in terms of classes, aggregates and submerged membership in them.

"Democracy will not be democracy until education makes it its chief concern to release distinctive aptitudes in art, thought, and companionship. At present the intellectual obstacle in the way is the habit of classification and quantitative comparisons" (Dewey, 1940, p.177).

This is not only an American problem, due to the Global Village humans populate, all educational, ecological, and economical problems are shared worldwide. In Education and the Global Concern, Torsten Husen writes:

Those who fail in school, failures that become particularly apparent at the secondary level and at the end of mandatory school attendance, leave school as illiterates who are keenly aware of their failures and in their desperation become trouble-makers. They feel that they are leftovers and can at best look

forward to temporary employment in public work programs (Husen, 1990, p. 50)

There must be a place for this segment of the population in all 1991 school designs. Consider the revolutionary change that has occurred in the status of 14-18 year old people in our societies, a change that has taken place over a very short period, just a couple of decades. By the late 1940's, the great majority of 14-year-olds, left school and entered the job market by taking typical entry jobs, such as errand boys, assisting experienced workers or simply by helping parents in small family enterprises. In countries with a tradition of apprenticeships, young people usually started working as apprentices with modest wages. By the early 1980's, mandatory schooling in most industrialized countries had been extended to the age of 16, but the majority of youngsters continued their education to at least the age of 18.

Tradition directs design when, in fact, the future should direct school curriculum design decisions (Torrance, 1979). Elementary programs must avoid the overloaded school curriculum experienced by the secondary programs of study. The enrollment expansion in secondary schools, which has made attendance at that level virtually universal, has taken place within the framework of the traditional, academically oriented type of secondary education. The school that prepared an intellectual and social elite for high-status, "white-collar" jobs and for the university was the model. But the preparation for citizenship in modern society required the insertion of new subjects, such as social studies and work-studies. These were added to the traditional, academic curriculum. On top of this, pre-

vocational courses were introduced in certain upper secondary programs of study. The result was an overloaded secondary school curriculum. This overload has sifted down to the elementary level disintegrating the little bit of integration in the course of study. In addition to a general education program inherited from the secondary elite schools, students have to take all kinds of specialized courses given by specialized teachers.

The result of the enrollment and syllabus expansion within the traditional curriculum framework is that secondary school curricula suffers not only from overload but from fragmentation into many subject areas and between many teachers. In the debate on secondary school structure that has been going on in the world since the 1940's, it has often been taken for granted among educators that there are two main categories of students; the 'theoretically' or academically-oriented on the one hand and the 'practically' or vocationally-oriented on the other. Therefore one would have to put them into two different kinds of curricula or invent different kinds of schools. The academically oriented, in particular, those heading for higher education, would need a broad base of preparatory courses in the mother tongue, mathematics, science, history and foreign languages, whereas the practically-oriented would have to take a minimum of the 'basics', mainly the three R's plus general orientation courses. The important thing for the practically-oriented would be to enter pre-vocational courses as early as possible. The decisive argument against any such organizational differentiation in mandatory schooling, is that for a democratic system to function, a common frame of reference and values is a necessary prerequisite.

It is therefore essential that the school contributes to such an integration between students from different home backgrounds and walks of life.

Where Dewey, Husen, and Jefferson agree is in the decisive argument against any organizational differentiation in mandatory schooling in a democratic society. They all believe that for a political system to function, a common frame of reference is essential to integrate students from different economic backgrounds and cultures. Life in the 1990's is in so many respects fragmented, manipulated, and differentiated that it is incumbent on the school to bring about the necessary common frame of reference. The modern complex, technological, information-flooded and competence-demanding society by necessity requires a common, broad base of general education before specific vocational competences can be established (Husen, 1990). What is required of citizens in modern society is enough flexibility to keep up with changes. This requires a solid base of skills and fundamental knowledge applicable to a broad repertoire of unforeseen requirements and situations later in life, both inside and outside the person's occupation. Ellis (1973) established that these skills are generated by play behavior. Using a future perspective, one can understand the paradox that the best vocational education is a good general education.

If we look back on pedagogical reform movements since the turn of the century, and in particular after 1918, we find many reform proposals with a common core under such labels as Arbeitsschule (work task school), activity pedagogy, individualization, vom Kinde aus (starting with the child), project

methods, etc.. Some of these proposals have been put into practice, but in order to succeed have to be met by two prerequisites: competent and committed teachers on the one hand, and on the other resources, both material and cultural, i.e., interested parents. Common to all these reform efforts is their basis of school learning on the children's own experiences and to bring real life; into the classroom. The experience-based pedagogy was sometimes developed by teachers in the public elementary school, the Volksschule, for a long time the most common school. It was developed in order to bring about a teaching strategy that took care of the whole range of abilities and interests and was not confined to an academic elite (Husen, 1990, p.53).

Rising cost and misgivings about what the schools are achieving have inspired demands for 'back to basics' teaching. It is maintained that the school should concentrate on that at which it is traditionally effective, namely the inculcation of book learning. Other kinds of learning that are important for the education of citizens should be taken care of by other institutions, such as the family, the church, the media, and the workplace. This conception of division of labor between the school and the other institutions is based on the assumption that the other institutions are able and equipped to perform their tasks successfully as they have been in the past. However, other institutions, not least the family, have also changed. Both parents are increasingly working outside the home and children are in institutions, such as day-care centers, kindergartens and preschools, at an early age. After class hours in the regular schools,

schoolchildren increasingly spend the afternoon in youth centers before they can go home and join their parents. Publicly or privately organized leisure time activities take up a considerable part of children's spare time, the rest of the time is frequently devoted to television.

Thus, the school is simply forced to shoulder educative tasks which were previously prerogatives of parents and/or grandparents. Such a development must necessarily have repercussions on school pedagogy. The school cannot limit its task to the transfer of a certain body of well-structured, textbook-based information. It must widen the scope of its task by opening up outside the school to the world. Between the poles of certainty concerning what is desired of a person and the uncertainty concerning what responses will be adaptive in the years hence lies a middle-ground fraught with tension. In the middle lie the responses that might have use later. They raise the question whether the child should be taught them formally, or merely be taught the processes whereby such problems or responses can be acquired, should they become relevant. This range of functions of an educational institution can be arranged on a continuum from training through problem-solving to play. Ellis (1973) describes this range of function thus,

In the first case, the task is clear: to induce specific responses by training. In the middle zone, the responses have some probability of being desirable, and are used as the outcomes to be sought for in a problem-solving approach. Here latitude in the manner of achievement is allowed, but constraints on the possible solutions exist. Toward the other pole the goals of the

behavior and the manner in which they are sought are freed as far as possible from constraint. It is at this end that playful or creative behavior is to be encouraged (p.122).

Educational institutions must balance preparation for the known with that for the unknown; they must balance work and play. What is required in order to make schooling a meaningful experience is to bring the world outside of the school into the classroom and base teaching on the students' experiences. This also implies the enlisting of help from people other than professional teachers. Every adult with experiences to share as holder of an occupation and, not least, as an active citizen, is a potential teacher.

The modifications to the structure of the school facilities to implement this changing role of the school relate to scale and accessibility. Within a building for thirty children, a sense of place and ownership grows for the children, parents and teachers. It is much easier for a parent or other citizen to enter into a house, with room for them not to feel as if they were interloping and intruding on an already limited quantity of space. For the author, twelve years experience as a volunteer in the schools rarely afforded the sense of warmth about the instructional space.

Sometimes one has the impression that bureaucrats, or other technocrats, think that schools should be managed according to the same principles as manufacturing industries. Accordingly, the school units have grown from the small red schoolhouses to pedagogical factories in glass and concrete. A proper balance must be achieved between those who advocate genuine educational values and those emphasizing administrative expediency. Positive advances in the

aesthetic relationship between the individual student and the learning environment can be achieved by an increase of size and variety of space provided. The student must be integrated with the entire population of the community and with the natural world. The integration must extend to the community for a complete educational experience to be achieved. The educational reforms of the 1960's manifest in the school design shown in Illustration 6 failed to deliver all they promised. These failures and the public's memories of them coupled with the worldwide awareness of the deep infrastructure problems our present world order is based upon, have resulted in a reactionary mood toward educational research.

Educational researchers were expected to provide a knowledge base for structural and curricular reforms. Expectations about what educational research would be able to deliver in terms of policy advice and improvement of classroom practices were running high. These expectations were not always met (Husen, 1990, p.57).

Our population has doubled many times since 1806. Technological advances have brought great comfort and leisure to the majority of Americans. Our cities have grown in number and size as has the number of children in mandatory public education. We have a world based economic order which brings us many goods for little money. All of this prosperity has been bought at a price which is now due on many fronts. and is seen as economic, ecological, educational and spiritual problems in our country.

Literature on Play

Groos in 1898 wrote The Play of Man, a text from Europe which once translated into English transformed thinking on play behavior. In 1949 J. Huizinga wrote Homo Ludens: A Study of the Play Element in Culture, this overview revolutionized the way the world viewed play behavior, moving the status of play onto a par with more cognitive behaviors. The definitive overview of play literature Why People Play, by M. J. Ellis in 1973; this was the basic written source of this researcher's understanding of play.

Classical views of what caused play behavior fall into five categories:

- 1) Surplus energy: This excess energy must be expended, the overt behavior is by definition play.
- 2) Instinct: The determinants of our behavior are inherited in the same way that we inherit the genetic code.
- 3) Preparation: The play behavior is instinctively preparing the player for later life.
- 4) Recapitulation: The player repeats the development of the species during its development.
- 5) Need for responses: The need for an individual to emit responses other than those used in work to allow recuperation.

Recent theories of play fall into six categories. They are the most familiar to the educators this researcher dealt with during the course of this study.

- 6) **Generalization:** Play is caused by the players using in their play experiences behaviors that have been rewarding at work.
- 7) **Compensation:** Play is caused by players using their play to satisfy psychic needs not satisfied in or generated by their working behaviors.
- 8) **Catharsis:** Play is caused in part by the need to express disorganizing emotions in a harmless way by transferring them to socially sanctioned activity. This concept has been limited almost entirely to questions of aggression.
- 9) **Psychoanalytic:** Play is caused in part by the players repeating in a playful form strongly unpleasant experiences, thereby reducing their seriousness and allowing their assimilation.
- 10) **Developmental:** Play is caused by the way in which a child's mind develops. Thus play is caused by the growth of the child's intellect and is conditioned by it. Play occurs when the child can impose on reality his own conceptions and constraints.
- 11) **Learning:** Play is caused by the normal processes that produce learning (Ellis, 1973, p. 78)

Each of these explanations make assumption which hold up within a finite universe. Each can be criticized using different manifestations of play behavior usually expressed by a particular age group. Modern theories of play include aspects of these eleven theories of the past 100 years. Two modern theories recently added are; maintenance of optimal arousal and competence/effectance

theories. Optimal arousal helps combine those theories based on stimulus-seeking and those about stimulus-avoidance.

Competence/effectance theory says, play is caused by a need to produce effects in the environment. Such effects demonstrate competence and result in feelings of effectance. White in 1959 first proposed this motive for behavior. He argues exploration, and presumably its relatives, investigation, manipulation, and epistemic behavior, cannot be connected to a visceral need. Instead "...the collective motive sustaining these behaviors is the resultant elevation of arousal mediated by the reticulate system in the brain" (Ellis, 1973, p. 101). The current word for this is empowerment in education.

An integrated theory of play was devised by Ellis which combines aspects of several explanations. This researcher has found Ellis' theory instructive in the design of learning environments. Ellis theorizes that play is concerned with the development of the capacity to deal with change. The implications for practice based on this theory are similar to the curriculum Dewey favored using practical experiences in a social setting of great diversity. Ellis builds the case for the power and importance of experiences, he writes:

Experiences are probably best defined as remembered relationships between responses and consequences. Thus with an increasing number of experiences individuals can make more reliable predictions as to probable outcomes of responses. They can deal with more complex assemblages or chains of such relationships. They accumulate more experiential data on which

to base their behavior and the complexity of their behavior increases accordingly (Ellis, 1973, p.117).

The case for the development of adaptive behavior via play relates to the arousal-seeking model which provides a motivational system that reinforces behavioral flexibility. The continued need for arousing stimuli will maintain the tendency for behavioral change which must be provided by the educational facility or it will be sought elsewhere. Play is behavior that results in indirect adaptation to circumstances where behavioral flexibility is an advantage. This flexibility can be used in other realms throughout life. Without advocating play and allowing for play in the schools the children will tend to mimic existing behavior pattern, which may or may not serve a purpose in the future. The relation between knowledge seeking behavior or epistemic behavior and creative behavior is seen directly during play.

George Szekely calling for a rich, exciting art environment overlaps the literature on a rich play environment.

What we create, select, or display through formal art media is directly related to how we experience, react to, and control our immediate environment. It is therefore important that art teachers provide their students with the richest environment possible by constantly bringing to their attention the best examples they can find of what is beautiful and interesting and hence inspiring (Szekely, 1988, p.10).

The preceding quote could easily be revised to read, "How we play is directly related to how we experience, react to , and control our immediate environment."

CHAPTER THREE

Play Environments 1971-1980

This chapter describes ten play environments built by the researcher between 1971-1980 and are representative of the dozens of environments he built during that period. They illustrate the evolution of the designs from aesthetic, educational, and bureaucratic facets. The gap between the clients being adults and the users being children is the gap bridged by the designer.

It was the fall of 1970, over twenty years ago, that the researcher was a sophomore painting major at Miami University in Oxford, Ohio. The Laboratory School of the McGuffey College of Education asked the Art Department if there was a student who would like to paint their six foot concrete culvert used as a tunnel on the playground. Since the author at that time was painting big and unusual shapes in his regular art surfaces, he volunteered. The Lab School paid for the concrete paints in four bright colors. Swerving geometric shapes were drawn around the cylinder and proceeded to be filled in colors.

This began the sequence of events which brought the author into the realm of environmental sculpture. This sculpture in turn became the basis of this research on the design of learning environments. The playground painting led to reading all the books in the Miami University library about playgrounds. These included Richard Dattner's Design for Play (1969) in

Illustration 13
American Playground Device Company
Advertisement from
The American School and University journal 1940

The slide, merry-go-round, swing, and climbing towers became the norm in outdoor equipment during this century. Begun in 1910 the steel recreational play equipment was not only the standard for all elementary schools it was almost universally the only equipment. This steel equipment lasts much longer and requires less repairs than the wood equipment which was popular from 1970-1990 and has resulted in many schools and parks returning to steel equipment today. The design reflects the educational systems belief that fundamentally play is a behavior to release excess energy and develop gross motor skills. This theory of play was predominant until the 1960's when research on the developmental value of play began to remind educators what Froebel had known a century before, children learn through play. The play-learning environmental design recently began to go beyond recreation equipment.

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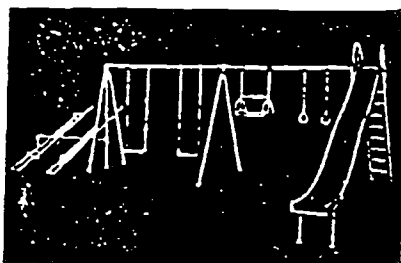
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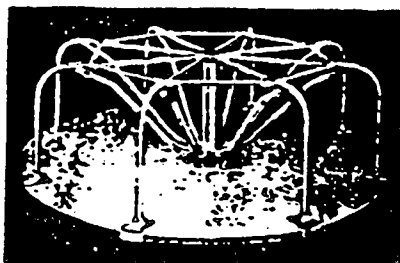
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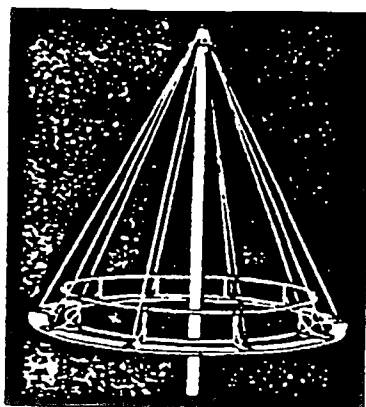
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M-4 MERRY-GO-ROUND



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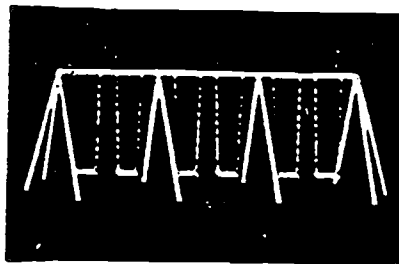
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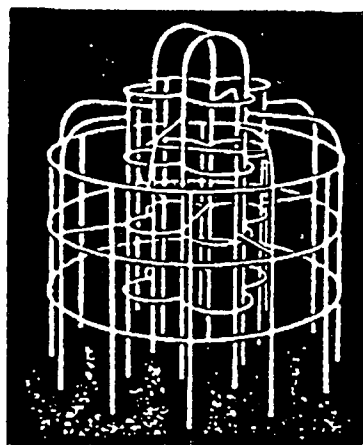
AMERICAN SWING SETS



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CASTLE TOWER



THE AMERICAN SCHOOL AND UNIVERSITY—1940

which he developed the use of Timberform Equipment, stone covered hills in New York City parks, and many topographical changes. Paul Hogan's Playgrounds for Free (1974) chronicles the use of found parts to build play equipment, and Lady Allen of Hurtwood's Planning for Play (1969) deals with adventure playgrounds. They all spoke of children and play, explaining their orientation toward the establishment of dynamic places for children to play. The researcher's philosophical roots toward play environments took hold that year. Then, too, began a series of lessons about the constraining forces of insurance, litigation, bureaucracy, vandals, maintenance, budgets, preconceptions, and construction.

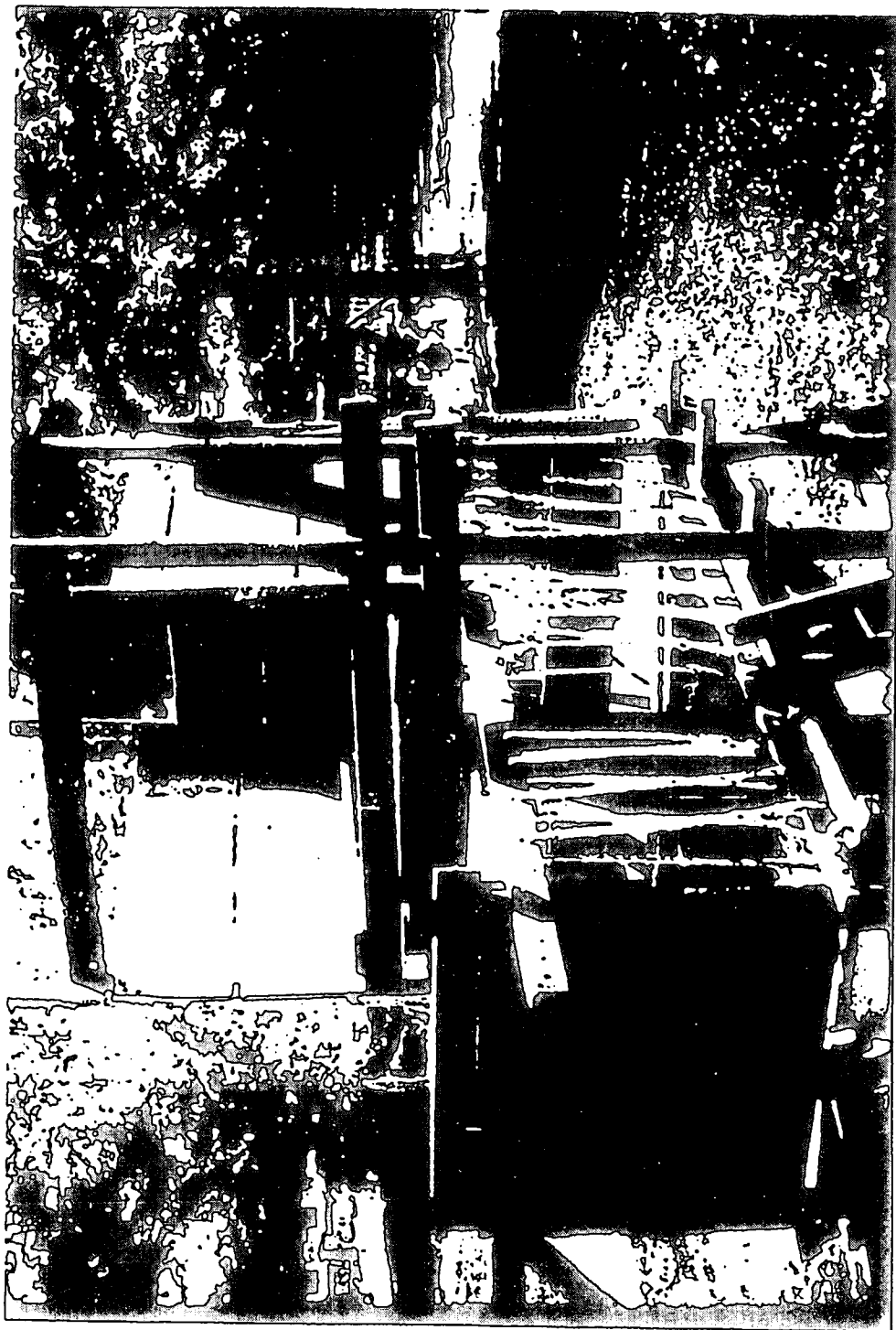
The researcher's undergraduate course work included the first three weeks of teaching kindergarten, a bitter reminder of how pedantic play can be taught. A course in educational media followed, where questions about three-dimensional educational media were not treated. The author's independent study of the reconstructionist educational authors Holt, Goodman, Illich, Dewey and Kozol lead to a radical departure from the 1970's College of Education curriculum. The concept that spaces teach lessons was from these educational writers. The nature of the educational facilities as built reflects the educators vision of human nature. These environments teach lessons on their own; they tell the children who they are supposed to be and how they are supposed to learn. Four beliefs in the nature of the learner have generated four different design criteria for learning environments. One type of environment tells the children that they are empty organisms learning through the operation of rewards and

punishments at the command of the teacher and play behavior is conceived as excess energy release. A second type of environment tells the children that they are active organisms learning through the solution of problems that satisfy their needs, play is perceived as preparation for adulthood. A third type of environment tells the children that they are social organisms learning through interactions with others; social psychology and group dynamics research lead to the perception of play as social adjustment development. The fourth type of environment tells the children that they are stimulus-seeking organisms learning because they intrinsically have to learn. Meaning is constructed not found; purpose is self-generated, not imposed. Our beliefs about human nature find expression in the buildings we construct, and these buildings in turn do their silent yet irresistible work of telling us who we are and what we must do (Getzels, 1974).

The author's painting career began to be transformed with an introduction to Duchamp, Bontecou, and Smithson. Peggy Heinneman, a graduate student in Art Education with an assistantship teaching art at McGuffey Lab School, led the author to the first play sculpture in this research. Having a few very active fifth and sixth grade boys in her classes, she led their conversations, which evolved into a plan of building a play environment outside her classroom. The synchronicity of adventure playground theory, various readings on child development, the move into sculpture, Peggy's nerve and her students' interest, a professor's truck, and a donated barn led to the creation of this first play sculpture during the Spring of 1971.

Illustration 14**McGuffey Lab School Miami University****Oxford, Ohio 1971**

Built with elementary school children during their regular art classes, this was the largest environmental sculpture in Oxford. Volunteer fifth and sixth grade boys built this installation over a period of three weeks. Using wood from a donated old barn and bolts supplied by the researcher, the students designed and built with great pride this play environment for their school. They learned the use of hand tools, tape measures, and the ability to co-operate on a joint project.



Built with five species of virgin hardwoods from a 1900's barn, there were hand hewn beams, 23" wide poplar boards, walnut rails, chestnut joist, and oak decks. Hand tools were used throughout, with lessons on structure, aesthetics, safety, cooperation, and completion of a task interwoven with laughter, sweat, and pride. The pleasure of acquiring skills and producing a product was evident in the enthusiasm the boys displayed each day. The canvas wall covering created a luminous cubby on the second floor. A tall ladder to the third level completed a vertical movement loop which was used for stop watch time runs by the most daring. The top level provided an observation post of the entire playground, a view onto the roof, and a vantage point coveted by all age levels. The Lab School was all concrete, brick, and glass, straight lines, right angles and ordered. The play structure was wood and canvas with shiny bolts, angles, protrusions, cantilevers, cracks and peculiarities. Identified with its builders' aesthetic and personal characteristics, it possessed a numinosity, embodied in the old wood and generated by the love of its' creators, far richer than the short three weeks it took to construct.

In the subsequent twenty years, the magic of those boys building with a few hand tools using the parts found in a barn, cutting, bolting, nailing, assembling floor by floor and wall after wall, creating a place to play, has remained with the author. The structure was up and operational for perhaps, a week. The principal summoned a meeting, and solemnly explained the structure was an "attractive nuisance" and would have to come down. Pleas for a revision, "I will

take off the top two floors", "Please let us keep at least the first floor for a stage" were hopeless. The verdict was in: nothing was to remain. The first lesson in the politics of school environments was delivered to the researcher with the assurance of a lab school report: the insurance company has the final say on educational design.

Politics is used here in reference to the administrations' expedient use of "them" to build an argument. The sagacious ability of adapting means to an end which some administrators cunningly employ with dissidents. Incumbency is a powerful force, traditions are not arbitrary, they have deep tap roots, and they don't mix their metaphors. Lab schools have vested interest as thick as the public schools which is why, usually, change in education is motivated from outside education. The deconstruct verdict began to expose to this researcher the nature of research.

Wanting to build sculptures, the author went down the street to the public middle school to ask them if they would like some play equipment. Their play equipment was left over from a time when play was seen as only gross motor development and release of excess energy. It was in disrepair and very dangerous not untypical of many school's existing equipment.

"Sure, let's pick a place for it" said the principal. Taking the tower apart, borrowing Bob Gaston's truck again, and redesigning a structure, a new play sculpture was built on the edge of the woods. The following week a fraternity had a beer party on the structure. They threw concrete blocks around and did a bit of damage. Two weeks later, the researcher borrowed a camera to document the

installation, he was chagrined to discover that the structure was missing. The principal was asked, he knew nothing, and said to ask the head of the Parks Department. Borrowing a truck, the investigative artist drove over to discover, "Yes, we took that wood off our land and took it to the dump." "No, the principal never told me about any play equipment". Driving to the dump to recover the forty dollars worth of bolts revealed everything was buried. The second lesson in the politics of school environments was complete: there is a chain of command which cannot be broken except by insiders.

Still wanting to build environmental play sculptures the author made contact with the principal of the elementary school in town. Located across town from campus, Kramer Elementary School had an older principal who loved to take students out to see the peacocks on his farm. He believed children should be encouraged to interact with all facets of the natural world. He believed that as many of the material objects as possible in the children's environment should become legitimate playthings, not merely their toys or playgrounds. His love of the children and concern for their experience in school combined well with the researcher's naive desire to build environments. The promise of "a lot for a little" led to the construction of a three-phase environment in the back yard of the school. The PTA found six hundred dollars for parts and labor, and thus began a summer's work. Another sculpture student, Larry Merriman, and the artist waited eagerly to begin while the school board bulldozed Osage orange trees off the acre lot. Osage orange

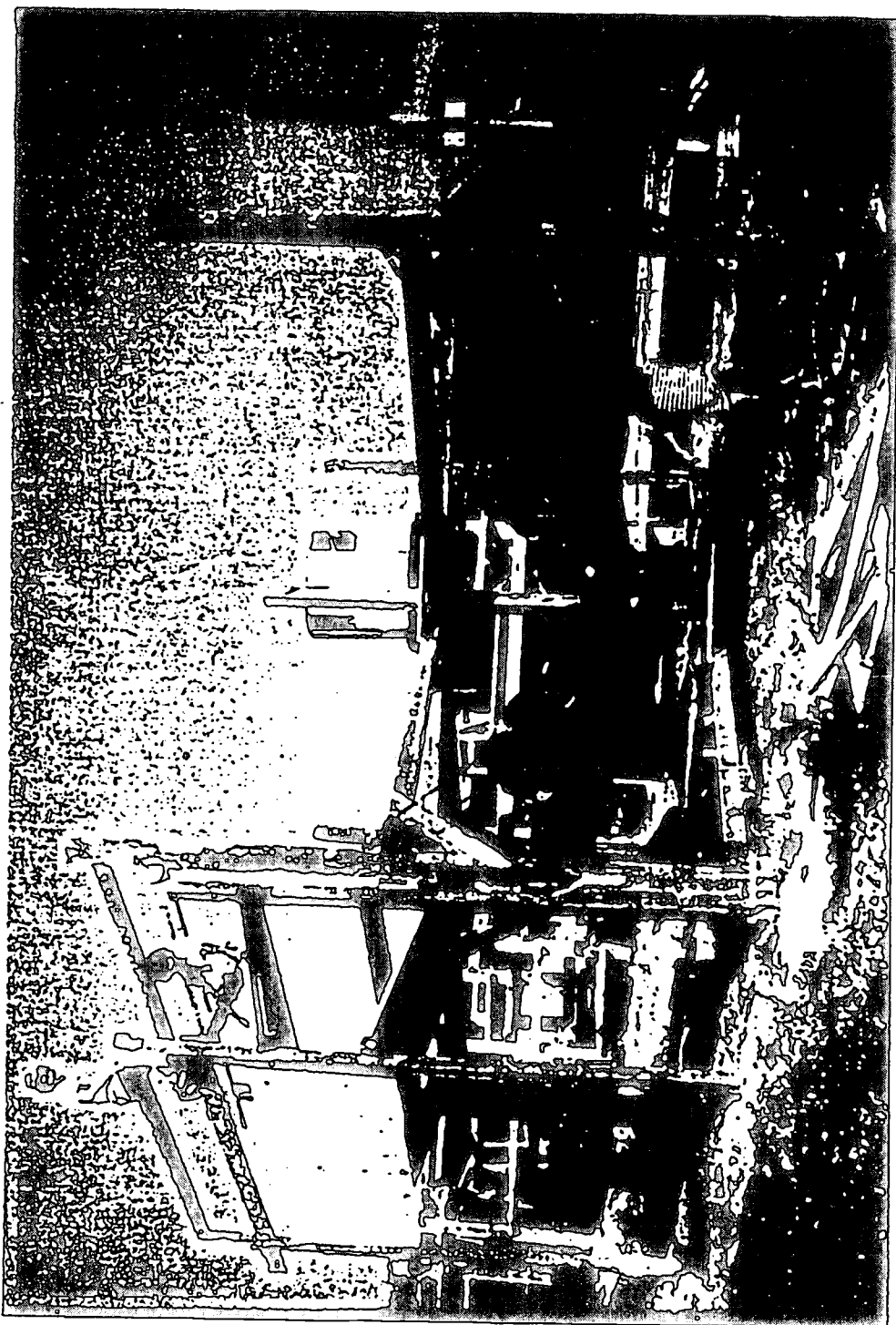
trees' thorns are three inch spears. "They all must go", this was the third lesson in the politics of school environments: once a tree is removed another seldom reappears.

The previous year the artist had acquired a Sears sabre saw and a 1/4 inch drill. The Kramer Elementary School site being four hundred feet from the building was too far to run extension cords. Construction proceeded with only hand tools. With no level or square and construction skills basically self taught, the craftsmanship reflected an innocent, childish quality. Having a seemingly unlimited amount of wood from various barns given as tax write-offs to the school, the structure flowed down the field. Tearing down barns, hauling wood, and building all summer brought a practical presence to the educational/aesthetic theories.

The structure consisted of an entrance building, with staircase, a swing arm connected via a suspension bridge to the triangular floor grid which followed the slope down to the cable spool tower. An alternative skinny bridge connected to a hill under which ran a concrete culvert. An eight hundred pound hand hewn oak beam eight inches by fourteen inches connected the tower to the lower section. Rough, eccentric, playful aesthetics characterized the environment, an example to the students of an alternative aesthetic to the brick block house character of the school. The diversity of movement patterns, forms, and materials used in the play environment reflected the researcher's vision of the learner as the locus of learning. The learner is not only a problem-solving and stimulus-reducing organism but also a problem-finding and

Illustration 15
Kramer Elementary School
Oxford, Ohio 1973

Built with the wood of a donated barn, this play environment covered 60,000 square feet. The children rarely complained of splinters, to the surprise of skeptical adults. The children moved into the rooms as fast as they were built. The range of creative play exhibited in the maze of rooms was significantly greater than seen on the existing metal equipment. The total cost to the PTA for this environment was \$5,000. The 36 suspended tire net created a huge bouncing rubber grid which allowed for three dimensional tag games, and a rocking lounge meeting place. This photo shows the tower without its cone top, due to a teenage after-hour deconstruction crew.



stimulus-seeking organism. The multiple vantage points, hideouts, lookouts, bridgeways, tunnels, and movement apparatus available to the children gratified their need for excitement, novelty, sensory variation, and perhaps above all for the challenge of the problematic.

The local health inspector ordered paint for the inside of the culvert to seal the concrete, in which he said, lived an organism which would infect the children. No sand would be allowed he said because of "neighborhood cats using it for a litter box". Each new inspector and new administrator brought new rules, generating the fourth lesson in school yard politics: administrators and inspectors must legislate on their jobs.

In hindsight the health inspector had no problem with the barn wood from hundred year old stalls, hand hewn - full of splinters, set on top of the ground rotting. We each have eyes to see only what we focus on, or put another way, perception is directed by conception. How the children saw and used the environment was demonstrated the following week.

The tower had a cone roof made of particle board. The neighborhood gang broke it off within the week for the fun of it, so they could sit on top of the twelve foot high spool. This was the researcher's first clue in school environment politics from the children's perspective. Through his first three year apprenticeship in public sculpture/playground equipment, the author's patterns/parameters, began to form into a design matrix.

The author attended a conference "The Player and the Environment" in Atlanta, Georgia, featuring Jay Beckwith. Having

read the book Build Your Own Playground (1974) describing Jay Beckwith's work, the researcher found out it was significant to meet another play sculptor. The book describes Jay's experiences in California building play environments with parent groups and about his design philosophy and criteria. This fourth book on playgrounds, along with A. S. Neill's book, Summerhill (1960), Silverman's book, Crisis in the Classroom (1970), and Sylvia Ashton-Warner's book, Teacher (1963), all focused the author's research on school environments.

The Kramer PTA pleased with the work, funded an addition the following fall. During his senior year at Miami University, the artist bought a chain saw, hack saw, vise grip pliers, and proceeded to build a 36 tire net. Bed rock was hit at 12", and it was decided to build a superstructure above the net, with a center support pole. This proved to be a poor safety decision, in that all bouncing threw the children toward the middle. Another feature added that summer was instigated by the desire for extending the topographical features of the environment. Miami University was digging a huge hole for their new skating rink, and they donated 200 tons of dirt for a hill to run a slide down.

Observing the use made of the structure to design changes in the next one is a key aspect of this research. The parents in the community would bring their infant children to play on the environment. Thus, although the principle size and skill level of the players was elementary school ability, the safety requirements were identical to nursery school criteria. The middle school children, after

Illustration 16

Miami Valley School

Dayton, Ohio 1975

The environment was built by the entire private school community over four weekends from salvaged and donated materials. The researcher made the design based on the available materials and the wish list of the staff. It was the first community-built play environment on which this researcher worked. It included a stage area, two towers, and two bridges. A smaller unit not shown was built by the senior class over by the kindergarten class room. In creating a play space for their children, the community, gave a clear message to the children that adults care about where children play. Community construction brings a spirit of conviviality, Illich speaks of, seldom found in schools today.



school, took to rolling 55 gallon drums down the slide and tore up the handrails made of black plastic pipe. This reinforced the research finding begun by those concrete-block-throwing beer drinkers that even though a structure is built for 70 pound children, it must really be built for 200 pound vandals. This transcribes into the design lesson: there are many factors to account for in an ecosystem, some seen and others invisible.

The rains washed huge gullies in the hill, and the 1000 pound concrete end anchors on the tire suspension bridge pulled out of the ground from the live load. After receiving these lessons from the skies, the disenfranchised, the system, and the laws of physics, the author felt unequal to the task of environmental sculpture. A teacher from Kramer Elementary School had moved to a private school, Miami Valley School in Dayton, Ohio. He contacted the author about designing and building an environment for his new school. With this inside educational contact, an opportunity to build a "Beckwith type volunteer" playground, and a substantial pay increase, the author built a playground in Dayton, Ohio. Parent and senior volunteers tore down a dairy barn, were given hardware by Dayton Power and Light, and proceeded to build. The effort was storybook perfect, great turnout and enthusiastic support by all the parents, teachers, students, and administration. The Senior class project was a unit for the lower school kindergarten. They worked with care and pride in the modification and implementation of the design. The poles were set and braced, all handrails were routed and

sanded, the school logo was painted, the swings and bridges hung, everything was completed in three weekends.

The researcher graduated in 1974, opened a frame shop and began a career as a watercolor painter. In 1976 he moved to Athens, Georgia and began the second phase of researching play environments. The dream of participatory sculpture returned, the research continued in a new state.

Putting together a folder of photos of his barnwood playgrounds, the author went to the principals of all of the Clarke County elementary schools. He met principal Estelle Farmer at Oglethorpe Elementary who told him to see Dr. Sharon Denero at Fowler Drive Elementary. The researcher presented a plan to the PTA board, they approved the budget (all new pressure-treated wood), and construction began with parent work days. Emmett Dupree, a Kindergarten teacher/carpenter, was a great help and inspiration on that project. It was an overnight success and soon plans were drawn for a structure at another school, Barrow Elementary. Thus began a fruitful relationship with the ten elementary schools of Clarke County, Georgia.

The playscapes tended for the next four years to be variations on the elements of bridges, tunnels, towers, slides, floors, and rooms seen in the Ohio installations. As the author's expertise grew and his preconceptions of the possibilities expanded, new concepts in the design criteria appeared to both the artist and the schools. One design generated the next, floors and poles began to slant and warp. Walls began to appear, new materials, forms, and relationships were

tried. Other schools heard about the projects, and, soon, the researcher began to travel around the state to work with parents building play environments for their school children. The many variations on the forms and space were an attempt by the researcher to instigate creative play. They were designed to elicit varied responses to the physical world with both the imagination and the body. They were created to broaden the aesthetic experiences of the community by lending both humor and diversity to the man-made structures. The importance of play to the development of creativity was explained in Chapter Two, the importance of creativity to society is evident with the pressing problems to solve. The place the children play has thus become more important to society than this researcher found educators perceived it.

This section is clearly an attempt to change attitudes of educators and recreators towards play. The playspaces we build for our children are not only places where the lessons intended by the teacher are taught. The playgrounds we envision for our children represent not only conceptions of spaces for playing but also our conceptions of the player. Play produces adaptations in the behavior of the child and these adaptations result from and contribute to the developing cognitive structure of the child. Educators should actively seek to create situations where the child is given opportunities to explore, investigate, and manipulate the items in their world. This world should allow the child to experience novelty, and/or increasing complexity and dissonance. The educational world should possess

arousal potential or impact by requiring the processing of information.

Educators, like parents, vary in the style or manner in which they think about the world around them, and their thinking can be conceived of as on a continuum. At one end of the continuum are the educators who are concrete thinkers, using rules, principles, dogma, and precedent to govern their lives and thinking. Towards the other abstract end of the continuum are educators who would tend to be more flexible, thinking things divergently when faced with new situations.

The play environments provided by this range of educators reflect their conceptual systems. In turn the learning environment established by educators influences the conceptual systems and hence behavior of the child (Ellis, 1974). Physical and spatial aspects of a play environment communicate a symbolic message of what one expects to happen in a particular place. The atmosphere of a play environment is readily apparent on entry and is reflected by subtle cues in the style of leadership and in the physical arrangement. Effective arrangement and construction of play spaces can facilitate the play process. The play environments designed by this researcher reflect his preference for "open-education". This term from the 1970's literature, philosophically wishes to communicate an openness of time, choice of activity, and flexibility in the education process. It recognizes the need for individualization: each child learning at his/her own pace and being evaluated in terms of his/her own progress. It recognizes the many individual ways of learning and

knowing and makes allowances in the curriculum for these differences. Also, in the 1990's, it has a strong environmental awareness and environmental ethic underlying the curriculum.

The following are specific projects which highlight the evolution of the designs. Obviously, most were located adjacent to elementary schools, this twenty year process led to the development of the Stueck Evaluation Matrix. This matrix is used to form the basis for the Suburban School, the model discussed in Chapter Six.

The Atlanta Bureau of Cultural Affairs received a National Endowment for the Arts Grant to fund Art in Public Places. The author was awarded funding for a play sculpture proposal which was a series of bridges and towers. Here we see the researcher's first clam floor, slanted floor, and circular stair-tunnel-bridge. Various polygonal floors, ladders, swings, hideouts, lookouts, and stainless slides complete the installation. The piece was built with another sculptor, R. G. Brown, on a rocky, tree covered site in the heart of Atlanta. The many walls began bringing volume to the environment, creating hideouts and courtyards, and forming a three-dimensional maze.

It was important that this was funded as a play sculpture, because, most buyers of equipment for schools see the play environment as variations on play equipment. This predisposition of the buyers awareness to categorize in product form what can be seen as a process has been everpresent in the research. The classification of the Anderson Park Elementary School play environment as Art in

Illustration 17
Anderson Park Elementary School
Atlanta, Georgia 1977
National Endowment for the Arts Grant

The theme of a three dimensional maze was used for this installation. Slanted floors add to the visual volume of the piece and add a playfulness to the gait of the participants. Participatory Environmental Sculpture began receiving more public money and attention by 1977. The discussion of what is Art and what is the function of the built environment was reaching beyond the museum. Note the rich brown color of the wood, due to treatment with oil borne Penta preservative. This wood treatment is no longer allowed for wood in contact with humans. Also note the limited ground cover; regulations have also changed since 1977 with regard to impact resistance under climbing equipment.



Public Places transformed the installation. The image of the structure as art is isomorphic with a vision of player as learner.

The working awareness of the school environment as part of the educational curriculum is a paradigm shift for many curriculum designers that presently give the design of the physical space over to an architect. What is in a name? Conceptions lead perceptions: perceptions lead reality. When play apparatus is seen by the managers of schools (boards, administrators, teachers) as useful for the development of gross motor skills, their shape and function is defined by muscle development. When those managers view that apparatus or equipment as a "Play Sculpture", the aesthetic dimension, awareness, and purpose is also addressed. Same object, same form, but different conception. When play is perceived/conceived as useful in the individual's cognitive development, emotional development, physical development and social development, then the place that play occurs becomes important. When play is believed to be irrelevant to these four spheres of development, then school managers, as well as park managers, will make minimal provisions for play and playfulness.

Enrichment/deprivation studies point clearly to the need for experiences or sensory input from engaging with the environment if the animal or human is to develop appropriately. The exact timing, duration, and nature of the experiences have not yet been clearly identified. Education is at a stage in time when it seems wise to engage the children in generalized enrichment. Ellis (1974), quoting Krech has called this the "Kitchen Sink" approach to environmental

enrichment. Ellis writes on the importance of early experiences. "From sense data resulting from his experiences the very young child constructs the basic cognitive or symbolic connections between events that provide the foundations for later development" (p.128). The third school in Clarke County the researcher worked on became the most extensive research site over the course of the study. The PTA commissioned a playscape with storage space for gym equipment. The site has a large slope in back of the fourth and fifth grade wing which allowed a longer and higher slide than seven foot towers. The playscape was built in three stages. The first year a forty foot slide was built down the hill, it had a storage room under the quadrilateral starting deck. A twenty degree slope was used to create the slowest slide in the County, the principal wanted a slow slide for safety reasons. The slide was four feet wide to allow groups of children to play on the surface.

The second phase, was a set of steps back up the slope they included a hexagon, pentagon, triangle, square, heptagon, and parallelogram staircase. An octagonal clam floor stage with a fire pole exit were connected by an arch bridge to the bottom of the stairs. The steps were connected at the top of the hill to the slide with a suspension bridge. Many children go up the slide and down the stairs; this follows a sort of levity children have which carries them to the highest point. Gravity is the reverse of this natural levity. Spiritual gravity is created by static building and curriculum, this gravity is quickly absorbed by the children (Steiner, 1927). The

Illustration 18

Barnett Shoals Elementary School

Athens, Georgia 1977-78-79

Built in three phases this installation slides down a hill with a 40' slide and climbs back up with a dozen large steps. Each polygonal floor is a different shape, angle, and orientation giving the "stairs" a ludicrous flavor. The researcher was searching for favorite floor shapes and relationships between parts. Building on slopes is a difficult design factor today due to the present concern for ground cover to absorb falls from structures. The teachers' decagon room in the background was the 1979 addition, giving a shaded place for observation of the environment. This photo taken in 1980 shows the packed red clay under the equipment. This was the last environment this researcher built on a steep slope, because it is impossible to install adequate protective ground cover.



signs of this gravity kept dawning on the author as he worked around schools.

This is, of course, a metaphysical observation which can scientifically be described in psychological terms. It can be observed in the eyes and affect of children inside the school and those outside. During informal observation of players on the structure, the researcher found the children when asked their favorite floor, almost unanimously said the triangle tower half way up the staircase. This was the smallest floor, each side being only five feet in length, and reached by a spiral triangular stair thus having only one entrance. In research on open classrooms, the "closed-space" room activities were generally quieter and more contained. It was determined the role of this environment in controlling group size affected the type of social interaction which took place. The social demands in the open-space room forced the child to respond to many different children playing in the same group, whereas, the social demands in the closed-space required the ability to interact with one or two other children who were usually in close proximity (Fitt, 1975).

The third year addition to the site was a tenth polygon listed in the Georgia curriculum guide, a decagonal teachers lookout. This lookout is a raised floor with nine benches and is about twenty feet away from the slide. It came about because the researcher found all the teachers sitting over next to the building in the shade so he built them a shaded bench near the site where they could supervise the children on the slide. School yard violence is often frightening, with

the teachers acting on "yard duty" to keep things under control (Moore, 1975).

The diverse movement possibilities and fantasy stimulation designed into the playscape were the researcher's primary criteria for this environment. During the 1970's environmental psychologist and environmental designers were working to establish the relationships between the "setting as is" with the "setting as experienced". In efforts to describe and conceptualize physical settings schemes in which both geographical-physical concepts and behavioral-psychological concepts were employed. The fact that environments surround, are multimodal, involve peripheral stimulation, give off too much information, and involve action differentiate them from objects. Robin Moore (1975) argued for the school environment to be a more engaging social mediator.

"Curriculum need" is often the most politically viable pretext for change. But there is the danger of its becoming an intellectual, adult agenda, unless curriculum is broadly conceived as covering the total spectrum of cognitive, affective, sensory, and psychomotor needs. In an "objective-obsessed" educational industry like ours this broad conception is unlikely to be adopted (p. 118).

In the same vein as Ellis's "kitchen sink" approach to design which allows a high degree of individual expression in an ambiguous, open-ended, and changeable environment, Moore calls for a revolutionary change in the way in which authorities manage school yards. The structure in back of Barnett Shoals Elementary School was

formulated on this complexity concept. The priority for design was to provide a sufficiently wide band on the skill and closure spectrums so that every child could find a place to support his or her needs at any moment. The key parameter in most environmental studies curricula of "diversity" was beginning to formulate the researcher's move into learning environments. The ecology of play and the learning of ecology began to come together in the reduction of conflict due to competition for scarce play equipment resources. The potential for giving the children an environment they could manipulate and one which would expose them to the many lessons of ecology so critical for our survival were beginning to redirect the research on learning environments. The two projects Moore (1975) describes in "School Yards: Anarchy Zone" were in the literature and school boards all over the country were being made aware of the need for ecology education. New calls for aesthetic education were being formulated by CEMREL to increase the beauty and richness of the school yards (Madeja, 1978). The research funded by local PTA's and Clarke County School District on the range of spaces, forms, and places possible was part of this national movement.

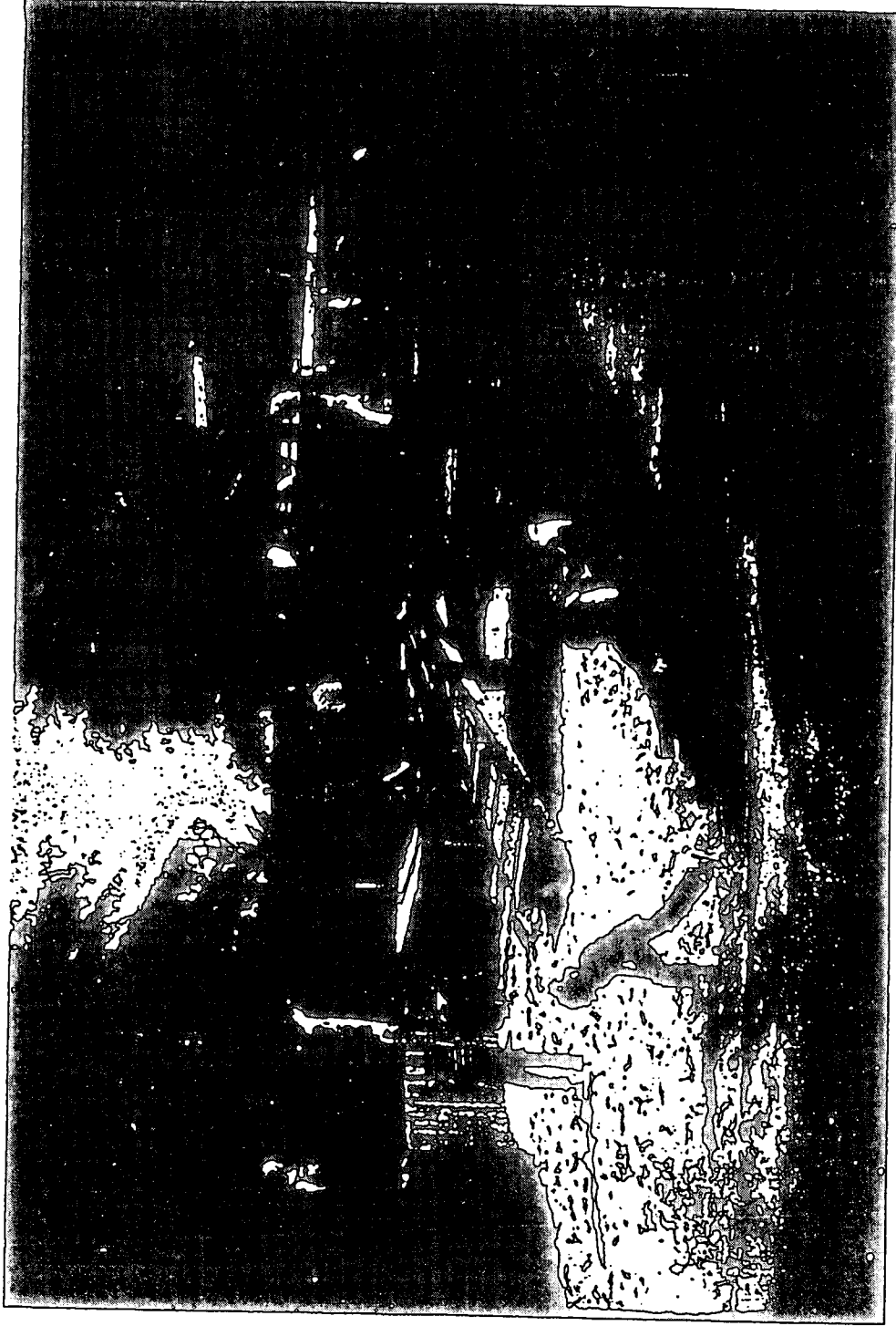
Eighteen years after Moore wrote calling for an environmentally based curriculum covering all aspects of life, Clarke County Schools, along with most of Georgia's school districts, are exploring an expanded concept of curriculum. That total spectrum of environmental needs with an integrated format is evolving. Moore wrote, "It will integrate play and learning, inside and outside, science and art, cognition and feeling, mind and body, heart and head, home

and school, school and community, school yard and surrounding region, play and learning, childhood and education" (Moore, 1975, p.118). The direct community action Moore called for to implement this radical change is materializing.

The researcher's first full fledged earthworks was built in reaction to the "stuck out on the plain look" of the fourth Clarke County School playscape at Oglethorpe Elementary. Without a hill, valley, or trees, playscapes, also known as play sculptures, look ungrounded to this researcher. On the flatter Alps Road site, a Ditch-Witch trench three feet deep was dug in a circle with one five foot deep semicircular trench intersecting it midway. 4"x4" posts, were set side by side in the shallow trench to form a three foot high wall. The dirt was dug out on the inside of the deepest trench and used to form a hill behind the three foot high wall. Then a 4"x 4" retaining wall was installed around the lower semi-circle. The walk along the top was made of polished granite 4" thick slabs. The floor in the center is a nonagon with the nine poles leaning diagonally nine degrees away from the center. The slide is eight feet wide to allow for roll-sliding, jump-sliding, flip-sliding and general slip-walking back up (see photo). This width was a variation on the standard 18" slide in order to discover what behavioral responses would result. Wide slides have been shown to reduce the amount of rigid use constraints which are associated with one at a time traditional slides. The tunnels through the hill are concrete pipes capped with truck tires. The environment was designed to allow a diversity of movement patterns. It uses a great variety of materials and forms to create shaded hideouts and

Illustration 19
Alps Road Elementary School
Athens, Georgia 1978

The central floor here is a nonagon with a pentagon lookout rising from the center. Radiating out to the semi-circular earth berm are a suspension bridge, an arched bridge and a suspended tire bridge. The eight foot wide slide, shown here in the front, descends into the below grade swing pit. The top of the berm has a polished granite walk which adds an elegant quality to the place. Originally a flat plane, the play environment now has hills to crawl under and a sand pit to jump into.



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sunny lookouts. The players interactions with the environment lead first to exploration, then investigation, then manipulation, and then should lead ultimately on to epistemic behavior. Since a child needs myriad interactions to maintain optimal arousal, an effort was made to provide these in the school yard. Ellis (1974) derived some guidelines for playthings from the three principles that form the core of the arousal-seeking model. He writes:

- 1) Children play for the stimulation they receive;
- 2) stimulation must contain elements of uncertainty i.e. that they are to some extent novel, complex, or dissonant,
- 3) that the interactions producing the stimulation must rise in complexity with the accumulation of knowledge about or experience with the object (the extent to which the uncertainty concerning the object is reduced) (Ellis, 1974).

The extensive gap between play theory, with its emphasis on manipulation of the environment, and the rigid environment usually built at schools became the design challenge for this researcher. By the Summer of 1978, Clarke County School District hired the author on a full-time basis under the Comprehensive Educational Training Act (C.E.T.A.) as a carpenter's assistant in charge of playground construction. In this way, the budget was diversified and more money could go into materials. The county schools, under the leadership of the Director of Plant Services, Preston Anderson, would match P.T.A. funds for structures. This arrangement, coupled with the volunteer parent labor, created extensive play environments for very reasonable amounts of money.

Illustration 20
Whitehead Elementary School
Athens, Georgia 1978

This environment has 29 floors of various shapes. There are no vertical poles which gives the piece a randomness unequalled in school facilities. The diversity of forms and shapes exposes the children to an alternative aesthetic. Walls are of canvas to be installed by the children with stretch cords. This wall method was designed to give a soft texture, colors, and flexibility to the environment. A major design problem is how to make soft, malleable materials to play with, materials which will hold up to after school vandals.



Daryl Dieball is an artist with wood and became the assistant on many of the environments. The primary grades playground of the Whitehead Elementary School began with the concept of a four-foot-on-center grid layout for the poles. The idea was to set all the poles at angles and then tie the flat floors into them as seen fit. A maze of various shaped irregular polygons appeared, created by a total of 60 floors. The field study of children using the Barnett Shoals floor staircase had identified the smallest triangle floor as the favorite. On this Whitehead School site, it was therefore decided to build many little floors creating a maze. The work proceeded slowly. Since the ground was rock hard, only half the holes on the grid could be drilled before the equipment, the budget, and patience gave out. Setting the 70 poles every which way was easy and fun. However, adding the floors was tedious, taking weeks of notching and fiddling with joints. The complete unit has the look of the aftermath of a tornado. It was designed as a counterpoint to the school building's harsh rectangular regularity. This structure was an example to the children that all man-made things need not be humorless. The PTA was to sew tarps set with grommets to fit the wall spaces, and the children could then add them with elastic cords in different orders to create hideouts. In that this never happened, it was shown to the researcher how important it is for new educational hardware to come with instruction manuals and in-service training.

Along with the help of a fine woodworker and teacher Paul Chew, the researcher built an environment which is a series of different bridges and aerial tunnels during the summer of 1978, at Winterville

Elementary School. The front structure is a zig-zag diamond room bridge connected via an aerial lattice diamond tunnel to the first of four bridge hubs. From here one can go down a squeeze bridge or over a suspension bridge. The other end of these bridges are connected via a suspended truck tire bridge. The central hub leads onto the Doboshi bridge (arch bridge), horizontal ladder, truck tire tunnel, and the suspended truck tire bridge. The Yatsushashi (zig-zag) bridge leads from the hub on the end of the two suspension bridges through the trees over to the hexagonal floor by the fire pole. The horizontal ladder connects the central hub with the Yatsushashi bridge to create yet another loop. The last two links in the maze connect the two story octagonal tower with the arch bridge and the hexagonal floor, one way with a balance beam bridge and the other way with a series of slanted polygonal floors. The front structure (faced with a W for Winterville) is a collection of diamond rooms creating a vertical maze with slide and ladder exits.

There is a move in this environment away from floor heights over six feet, this coupled with the spreading of sixty tons of sand reflect the growing awareness of the dangers of falls from equipment. The lower height allows a for more expansive lateral play rather than a vertical format. The structure here is spread out with the many courtyards to ensure equitable territories for boys and girls. The design of each subsequent generation of play environments refines or abandons aspects of the design discovered by analysis of the previous environment. The researcher using both observation and

Illustration 21
Winterville Elementary School
Winterville, Georgia 1978
Phase I

The Zigzag Diamond Room Bridge shown here is the entrance to a bridge maze in the woods. The many rooms created by this bridge elicit playing house or apartment. The author has observed all the chaise shaped rooms being used as reading cubbies. The angled structure with no vertical supports is a visual counter-part to the strong vertical-horizontal architecture of the school buildings. The aerial lattice diamond tunnel shown in the background gives a safe place to practice walking the ridge of a roof.



casual interviews instituted this evolutionary process during the course of this investigation.

While he was director of the Unit of Environmental Analysis and Design at the Laboratory of Community Psychiatry, Harvard Medical School, Mayer Spivack developed polar paradigms for observation to relate behavior of children playing to the setting. These paradigms are designed to facilitate a series of mutually exclusive, qualitatively unique observations and judgments about the social behavior, physical behavior, and the process of play. Together, they generate a schemata for identifying differences in behavior that are in conflict with or in agreement with features in the environment. The ability to make meaningful observations that accurately describe the behavior characteristics of children as they play on the environments will be amplified using the nine behavior tendencies on the paradigms.

- 1) Stimulus-avoiding versus stimulus-seeking
- 2) Relatively rigid versus relatively fluid
- 3) Ritualized, closed versus evolving, open
- 4) Unique event versus repeated with variations
- 5) Transient versus enduring
- 6) Inappropriate-to-context versus appropriate-to-context
- 7) Erratic-unlinked versus flowing-linked
- 8) Functionally fixed (needs high-specifity environment) versus functionally flexible (needs abstract environment)
- 9) Solitary, self-absorbed versus social-object-oriented

(Spivack, 1974)

These polar paradigms are for the most part self-explanatory and formalize the observational matrix used during the evolution of the environments presented in this paper. The Stueck Evaluation Matrix presented in Chapter Six incorporates these behaviors on the needs axis of the three-dimensional grid. Whereas, Spivack is observing children with mental illness, the researcher was building environments for children in the public schools where the entire range of behaviors and mental health are found, and, thus, the environments were designed with this in mind. By designing abstract or generic play places, the children are presented with the task of deciding what the environment is and the concomitant behavior setting within which they will organize their play. Functionally flexible play should result more often under these circumstances.

Most of the sculptures from these nine years can be thought of as either large metaphorical objects or as maze complexes. The goals were to give the participant a variety of vantage points, experiential diversity, diversity of material, form, and movement, a sense of place or presence, and exposure to a playful, humorous, and/or ludicrous design. The play structures afforded a window onto opportunities available in school environments. The first opportunity was to allow the player to manipulate the environment. The second opportunity was to incorporate more elements of the curriculum into the physical structure of the learning environment. These curriculum opportunities are the three-dimensional educational media aspects of

the playscapes. They were expanded upon in the learning environments presented in the next chapter.

The Timothy Road Elementary School play environment was built by parents in eight days. It is a combination of a wooden palace, a hexagonal tower, a series of bridges, a set of swings, a teacher lookout, and connector floors. The unit weaves among 30 pine trees and down a couple of old field terraces covering about a half acre. The unique features are an inverted octagonal cone tower, a slanted two story pentagon tower, a triangular maze structure, and the longest highest balance beam in the county. This was an experiment in light of the old five inch high, eight foot long, three inch wide, nowhere to nowhere balance beams found on many school playgrounds.

The history of institutional playground equipment design, especially in public schools, has shown that there is a strong propensity for equipment to be copied. The hazard of this practice is that our imaginations become limited to those alternatives we have seen, and we fail to explore further to discover the unique solutions which fit our own requirements. Buyers of equipment sometimes are beguiled by superficial stylistic elements in play equipment they have seen, and decide to purchase similar pieces. This same propensity is found in the purchase of school buildings. By copying one not only copies successes, but also errors.

Illustration 22

Timothy Road Elementary School

Athens, Georgia 1979

Seen here are an inverted octagonal cone tower next to a four story hexagonal tower. Behind these towers is a two story leaning pentagon tower. Many interior hideouts and sunny lookouts are found in this wooded environment which winds through the trees and down two terraces. The forms are abstract enough to refer across time and culture to many different societies buildings.



The shape, relationship to other elements, materials, and texture of the basic five features in play environments was constantly modified to create a research tool for observing the player's relationship to the setting. The researcher watched to see if the children using the environments were responsive only to internal cues; or if they were animate, exploratory, and reactive. He observed the players and whether or not they fit their behavior to the contours of the environment and flexed, changed, and modulated in ways that corresponded to fluctuations in the environment indicating adaptive conditions. Thinking patterns are exposed by watching if the play behavior is ritualized or of a free, experimental, exploring, and adaptive style (Spivack, 1974). Judgments were made about how much the players behavior interacted with, or interwove through, the objects of the environment, in a coherent, flowing way. Changes in the play environments elements were made to evaluate functional fixity and functional flexibility. The goal of this researcher was to encourage a high level of adaptability by eliciting flexibility with unusual conditions around which to organize their play. Thus unexpected forms such as an inverted octagon-cone tower, slanted floors, and zig-zag bridges become the expected.

The hexagonal tower is three stories with access up through the floors, the cone roof is cantilevered out in all directions, the roof features slot windows for an overview of the entire site. Variations on this tower design include Comer Elementary School's Triangular Tower, Greensboro City Park's Pentagonal Tower with a basement,

Illustration 23
Winterville Elementary School
Winterville, Georgia 1980
Waterworks

The lookout towers on all the environments had always been entered through the floor. This one has a side entrance and no top. After two weeks of watching the children play on the edge of the tower the researcher added the rest of the arch to enclose the tower. This playground also had the fastest slide which was modified to decrease the speed after a few pile-ups. Design changes came after these experiments which extended the current practice. This environment was fitted with a "Waterworks". Pumps, hoses, tanks, aqueducts, valves and pools were designed to allow waterplay for the kindergartners. The tanks and valves were stolen, the pools not maintained and after a couple of years the water lines were removed. The safety, vandalism, and repair concerns are three of the design criteria constantly being assessed by the researcher. It is important to review facilities from multiple aspects and not let any particular one control design.



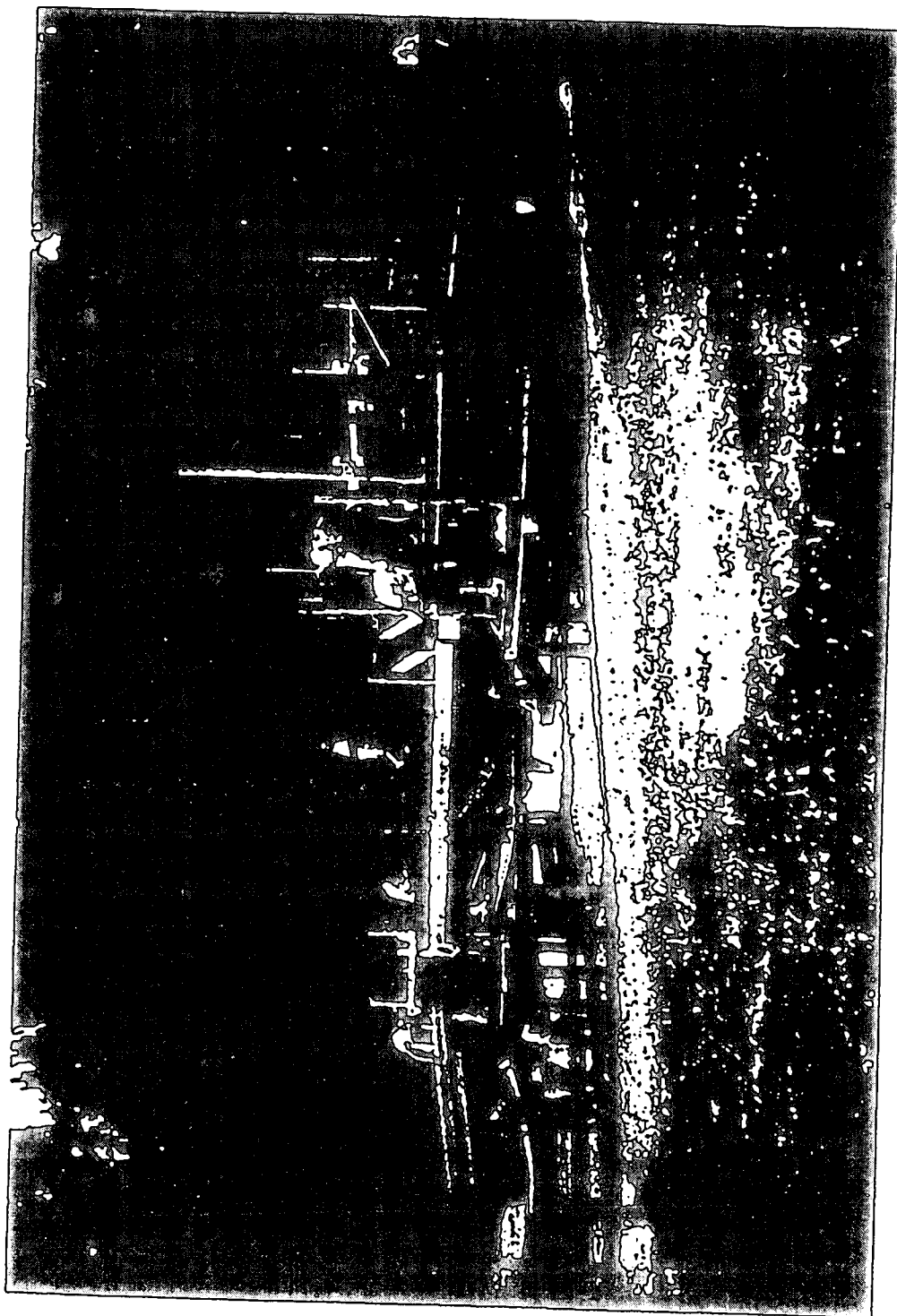
Winterville Elementary School's barrel top "water tower", and Morgan County Elementary's control tower with room extensions and an internal sand box. Towers are foremost lookouts, as caves and rooms are foremost hideouts. These two elements in whatever shape they manifest are fundamental to creative play environments. Bridges, no matter what shape, are means of going from one place to another. The rope swing, horizontal ladder, and cable ride are the examples of the range of "bridges" used by this researcher.

The first teachers' lookout was designed and built by the parents of Timothy Road Elementary, this element has become a regular feature of the researcher's playscape design. This lookout is an example of organic parent design hopefully generated by these environments. When school managers, parents, and children are given the freedom and encouragement to manipulate the environment a dynamic, relevant, organic whole will appear.

Illustration 24 is of an "underground" maze aligned within a crescent shaped hill. The tunnels elicit games of mining, sewers, and caves, presenting the players with multiple entrances and exits. This was built in 1978 long before Teenage Mutant Ninji Turtles carried the imagination of every school age child down into the sewers; it does like the Turtles address a fascination for dark crawling passageways under the earth. The concave-convex bridge, also known as the high way-low way bridge, the author feels is aesthetically one of the most interesting bridges in all the playscapes. The interrelationship of the two bridges when seen from the side

Illustration 24
Gaines Elementary School
Athens, Georgia 1978

The crescent shaped hill has six entrances from each side and two out the top to create an underground maze. The elliptical arc suspension bridge on the far left in the photo creates a leveraged bounce system, good for little children to bounce their teachers. A suspended truck tire tunnel leads into one of the underground tunnels. Over, under, around, through, bouncing, sliding, swinging, and crawling these are the ways and the means of this environment. The entrance gates to the twelve tunnels were painted the color-wheel colors. The painted plywood never looked integrated to the researcher and was replaced with tongue and groove 1" x 4"s.



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reminds the author of an Anthony Caro sculpture which is exploded out from one vantage point and then integrated from a vantage 90 degrees away.

Gaines Elementary School was renovated in 1983, a new bus drive went right through the playscape, and a new environment was built by the author. Known as "Just Kidding" this environment is comprised of four houses and a walled bridge. The bridge which is over the entrance to the town is three inch thick Plexiglass which allows the children to watch others dance from below. The tallest building, known as wasp tower, has a slide out of the upstairs window. There is a spiral ramp up the inside with the entrance doors perpendicular to it. These leaning doorways give the tower a lyrical levity, a humorous frivolity deemed appropriate for a play house. Dealing out the unexpected was the design criteria for "Just Kidding". The teachers' lookout is "underneath" an upside-down house. The music house has warped walls, kettle drum steep slide sides, and an orchestra pit filled with sand. The central house, called Network House, had a woven net bed as half of the second floor. After three replacements, it was decided the vandals were serious, and, now, there is just half a floor, with a "just kidding" net in it. The Network roof warps over the city's favorite hideout created by the after school crew. Originally the attic of the Network House was boarded up with the ceiling of the second floor. The children's retrofit crew consistently thwarted all adult attempts to board up the access holes they cut through the ceiling to the attic. After discussing the alternatives with the teachers, it was decided to allow the

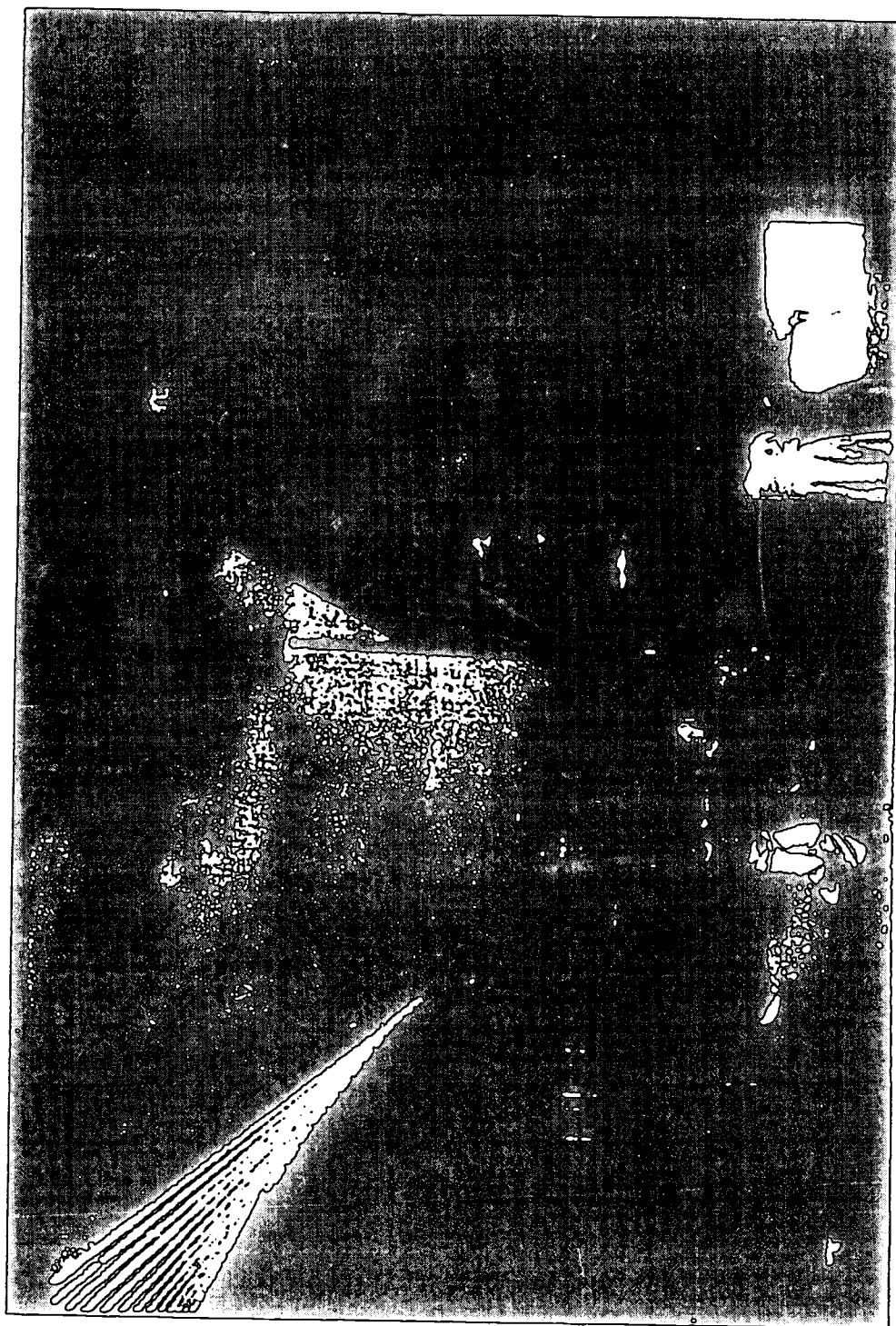
Illustration 25

Gaines Elementary School

Athens, Georgia 1983

"Just Kidding"

This play town has four buildings plus a town wall with an entrance gate. The warped floors, walls, and roof lines give a playful, silly quality to the substantial feel of the place. The "Just Kidding" village is a prototype for outdoor/inside classrooms where curriculum lessons can be built into the environment. A house with a map of the county was in the plans but cut out of the budget. Unfortunately, no interest was shown by the staff in using the environment as part of the curriculum. The author eight years later was able to build a map house in the Oconee county. In 1991, the author has found a growing recognition of the power of the context to influence behavior.



children to play in the attic, a window was cut for ventilation, and it has become the supreme hideout. The town was the first step of the researcher's move away from playscapes into learning environments. These two categories are by no means exclusive, one does play in learning environments and learn in play environments. They are demarcated to map the emphasis on specific curriculum content found in the recent environments.

In the next chapter, seven research environments designed by the author are examined. The learning objectives of geography, ecology, geometry, and art are analyzed and matched to the unique features designed to elicit responses. Sometimes, the children were involved in construction; sometimes volunteers; sometimes a construction crew. The sites range from day care centers, to public schools, to city parks, and the cost from fifty dollars to fifty thousand dollars.

Illustration 26
Oglethorpe County Elementary School
Oglethorpe County, Georgia 1978

These are student construction workers building their school a play environment. Using critical thinking skills, math skills, and practical arts skills, the fifth grade boys in one class worked two weeks to complete the equipment. They took the project every step of the way from concept to completion. Learning co-operation skills they worked very ambitiously on a project admired by their fellow students.



CHAPTER FOUR

Learner-Directed Educational Environments

During the last fourteen years a series of learning environments were instituted in Georgia by the author. These were based on four principles of educational design. First, the theory that playfulness is a basis for creativity development. Torrance's (1979) and Lieberman's (1965) landmark works with children found direct correlations between these two behaviors. Second, it has been shown there is a direct correlation between self-direction and creativity (Berlyne, 1966; Ellis, 1973; Taylor & Vlasto, 1975). Third, that motivation for the form and content of "play" learning environments stems from research on the development of aesthetic awareness within a visually rich environment (Eisner, 1974; Madeja, 1978). The fourth principle is about values and is based on research on environmental awareness and man's impact on our resource base (Soleri, 1983; Barnaby, 1988). The construction of learning environments cannot be value-neutral. The environments concretely influence behavior and attitudes toward the earth and are the most visible example of our aesthetic values to the children.

Between 1971 and 1976, the author worked on play environments in Oxford, Ohio. It was there that the background data was formulated and the literature was studied for this research.

Research on these play environments forms the basis twenty years later of the author's evaluation matrix presented in Chapter Six. During the 1970's experiments and writings were created advocating richer environments to promote better learning through all the senses. Lady Allen of Hurtwood's book, Planning for Play (1968) and Anne Taylor and George Vlastos, School Zone (1975) summarized the international movement. Taylor wrote:

In this book, we explore architectural solutions to some educational problems. We consider classroom environments and outdoor play areas as functional art forms - we see them as three-dimensional textbooks. ...At a time when concern for the ecological and man-made environment is synonymous with survival, excellence in design may help to sensitize people to their surroundings (p.9).

She goes on to speak of the theory behind the new architecture:

Children's brains are not compartmentalized. They do not learn certain subjects at a specified time of the day. Rather, they are constantly learning, in an integrated way. If a child is an essential part of the learning process, he should be able to make many choices in what he learns, and should be strongly motivated by the excitement which permeates a classroom. He should not be a passive participant, but an active one who can make choices and even change the environment to suit his needs (p.11).

Hurtwood explained the evolution of Adventure Playgrounds and the developmental theory behind their benefits. The children create

their own play structures from parts supplied by a play leader. The adult leader helps with tool use and checks safety of the structures. It has been found that after a few years of building experience, the quality of the designs and workmanship excels. In the face of numerous obstacles posed during the course of this research, the success of these child built environments has nevertheless encouraged this researcher.

The City Curriculum presented in Chapter Five and the outdoor playscapes presented in Chapter Three explore the use of a variety of level changes to break down the authoritarian height of the teacher. Unless the adult stoops to the floor, the child rarely gets a chance to look directly into teacher's eyes. The traditional relationship always puts the student in a subservient position; lofts change this, eye to eye contact can promote better communication.

Taylor and Vlastro refer to three other key researchers in the movement for enriched educational environments:

Piaget has stated that the more new things a child has seen and heard, the more he wants to see and hear. The rate of the child's intellectual growth then is a partial function of his environmental opportunity and circumstance....John Dewey and later progressive educators have stated that experience-centered education is the best way to learn. The British infant school has shown us a way to use experience-centered education in a way that reflects its educational philosophy: "active doing is the best way to learn."...Maria Montessori, has shown that concrete experiences, in prepared environments with specially designed

and finely graded materials, provide for optimal learning, from simple to more complex tasks....Environments can be designed so that there are built-in principles of knowledge for young children to discover right in the environment (Taylor & Vlasto, 1975, p. 22).

By planning for many ways to gain information, designers are providing for a diversity of learning styles. Multisensory learning provides a system that offers many ways to learn. Some children learn better by feeling, and some by seeing. In art education's creative activities, this range is noted and planned for. It has been this researchers contention that the line between art education and "the rest of education" can and should be bridged at every opportunity. Art is not only skill development, it is awareness and attitude development. As Gabo, Tatlin, Klee, and Kandinsky before us so often wrote, art is about the spiritual. To teach the spiritual, it must be manifest in all our behaviors and creations.

The research reported herein was conducted using a structurally evolutionary method; each environment was generated by the author in conjunction with his teams of participants and modified using the results of the previous ones. A total of eighteen outdoor environments and fifteen indoor environments are reported here. During these same years another forty environments were built in Georgia and other states by the author. Over the course of the study an increasingly complex system was developed following the four principles of educational design presented above. Learning environments which evoke creative thinking must resemble good

playgrounds. Ellis writes, "The neighborhood playground should represent a conscious attempt to complexify the children's neighborhood environment so that there are opportunities to explore, investigate, manipulate, and engage in epistemic behavior (Ellis, 1973, p. 139).

The reason play behavior and creative thinking are important elements to include in our schools is that their role is critical to the survival of society. How to prepare the individual for conditions in which many of the circumstances are as yet undefined is the problem of schools. Play seems to be important as part of the process of preparation for the unknown.

Acknowledging the simultaneity of school curriculum and facility design (Ornstein & Hunkins, 1988), the author uses the terms interchangeably. Too often in educational literature, the content and the context are analyzed and discussed separately, thus disintegrating their simultaneity. One cannot exist independent of the other. They are usually seen as mutually dependent when, in fact, they are one and the same in the areas we are concerned with; aesthetic awareness and creativity development (Hall, 1966; Illich, 1976; McLuhan, 1964; Steiner, 1927). A key aspect of play is the ability of the participant to manipulate reality both physically and mentally.

In the evolution of the educational facilities presented here, design criteria that was other than educational often took precedence. Safety, maintenance, cleanliness, durability, liability exposure, and adult aesthetics all share the design field with fun and

learning opportunity. Each of the seven projects presented suffered from these often conflicting parameters in various ways. It is the intent of this educational criticism to examine how they have been implemented in a predominantly two-dimensional educational atmosphere.

The author's first student-built city was in 1980. It represents the most complete learner directed environment in the study. The entire City Curriculum will be presented in depth in the next chapter. It was built during a year the researcher was working throughout Barnett Shoals Elementary building various learning environments.

Lofts: Barnett Shoals Elementary School, Athens, Ga.

Twelve reading lofts were built in kindergarten through third grade classrooms. Two kindergarten lofts were built with "child labor" to student design specifications. Reminiscent of the first structure built with student input in 1971, these projects captured the imagination of the students and were entered into with enthusiasm and diligence.

Ten different lofts were built in first and second grade rooms using sticks, tree trunks, turned wood, rope, sheetrock, metal, plastic, canvas, and cardboard. They were in different locations in the room, some over the door or by the windows, others out in the middle. Some the teacher could change, some held only four children, one circled the entire room and held all the desks on the second floor. The participants' reactions and behaviors elicited by the teachers and students were noted. One five foot high loft had only one giant thirty

Illustration 27**Barnett Shoals Elementary School****Athens, Georgia 1980****Kindergarten Learning Environment**

Soft carpeted lofts, canvas walls, a drop down tent, barrel tunnel, reading net, and a "Ball Bearing Machine" combine to create a unique multidimensional environment. Hidden magnets, built in periscopes, pulley systems, and mirrored walls add a magical, manipulable quality to the life in this classroom. In this school with ten foot ceilings, two floors were easy to install. The curriculum objectives of this age are easily facilitated with a three dimensional learning environment.



inches high step for access. No child ever complained about access; few adults went upstairs. One loft could be entered through a hollowed out tree which held up the 8' x 8' floor. Many of the lofts are still in use after twelve years. To this researcher, the importance of creating a special environment for each room was to lend a character and diversity to the school. The individual classes identified with their lofts, moving into the space quickly and comfortably.

Kindergarten lofts were built by fifth graders as special projects. The children designed, ordered materials, cut, bolted, nailed and stained the lofts. The Kindergartners were doubly impressed with the skill of the big kids and grateful for their work. The volunteer fifth graders were proud of their accomplishments. John Dewey in his *Pedagogic Creed* of 1897 and Eliot Wiggington in his *Foxfire* principles both encourage similar curriculum. Kristine F. Anderson briefly summarizes the *Foxfire* thinking:

- 1) All the work teachers and students do together must flow from student interest.
- 2) The role of the teacher is that of a collaborator, team leader, and guide.
- 3) The academic integrity of the work must be absolutely clear. Each teacher must consider the local or state-mandated skill content lists and then integrate the content with other subjects.
- 4) The work emphasizes student action rather than passive learning.

- 5) There is an emphasis on peer teaching, small-group work, and teamwork.
- 6) Connections between classroom work, surrounding communities, and the real world outside the classroom are clear.
- 7) There must be an audience beyond the teacher for student work.
- 8) As the school year progresses, new activities should spiral gracefully out of the old.
- 9) We must acknowledge the worth of aesthetic experience... and encourage students to use their imaginations.
- 10) Reflection - some conscious, thoughtful time at key points throughout the work - is essential.
- 11) The work must include unstintingly honest, ongoing evaluation for skills and content, and changes in student attitude (Anderson, 1991, p. 12).

The author's second student built playground was built in 1978 with a seed money grant from the regional educational service department (C.E.S.A.). The author helped build this playground in Oglethorpe County with sixteen fifth-grade boys from a special education class. This was an important experiment which is presented in detail here to show what students are capable of building. It was then, and still is, an example of how children rise to the occasion when their spirits are engaged.

Illustration 28
Oglethorpe County Elementary School
Oglethorpe County, Georgia 1978

The sixteen students who built this play environment were usually distinguished in their school for the trouble they caused. This project gave them the opportunity to be admired by themselves and the entire school. Adding tunnels, bridges, lookouts, and climbing floors to the playground they put their new carpentry skills to use building a lasting addition to the school. There are other places where older students can transform the educational facilities to suit their needs. Gardens, lunch rooms, furniture and buildings themselves are not beyond the interest and skills of industrious elementary children. The graceful spiral of activities Wigginton finds with high school students, this researcher also found in working with elementary school students.



Most of the boys had one or more handicaps, such as mental retardation, behavior disorders, cultural deprivation or learning disabilities. When these boys, who had failed at most school assignments, planned and built their playground, they gained a new sense of self-confidence....

First, the boys planned and ordered the materials. Lumber and hardware worth \$2,000 was furnished by the P.T.A. and the Board of Education.

They determined the locations of the holes, dug the holes and set the poles for the play structures. Then they bolted the joists, notched the posts, nailed the decking and sanded the handrails....

For the special youngsters who constructed it, the playground was a three-dimensional learning environment, not only afterwards, but especially during its construction. When students used a tape measure, fractions became useful realities; when they tightened bolts, engineering stresses became safety considerations; when they drove a nail, angles of force became efficiency factors. These skills will remain useful throughout their lives....

The children manipulated the world of three dimensions. This was unlike the usual two-dimensional paper-and-pencil exercises taught in most schools. Children are usually denied opportunities to conceive concretely in three dimensions; is it

any wonder, then, that we are surrounded by unimaginative, badly designed homes and public buildings? (Clements & Stueck, 1984).

If children are to grasp the connections between the mental and physical, and to learn to look closely and critically at their environment, they must be taught to think in three dimensions. For children like the ones who built this playground, the purpose of this kind of work is obvious; the result is concrete and real. Interest soars and ultimately, society benefits when children are given the power to make changes in their physical world.

During 1979, the researcher worked building three dimensional educational media for Barnett Shoals Elementary School. Every effort was made to involve the students in the design and construction of the pieces. The largest installation was the 200' x 100' Earthworks, built by all five hundred students for two weeks. In the Earthworks, students worked both from intrinsic motivation and for intrinsic purpose. Bringing shovels on the school bus and wearing old clothes, they spent art class, gym class, and free time digging and building roads, tunnels, holes, hills and trenches. When asked, parents and children alike felt that children's excitement for going to school more than compensated for the trouble of washing dirty clothes and the loss of classroom learning. Younger children brought their Tonka bulldozers, graders, and steam shovels, to build the structures of their personal fantasies. Upper elementary level children, in the gang age, worked together with real shovels to build monolithic

structures: the longest trench, the deepest hole, the highest hill. The author wrote of this process:

Three-dimensional manipulation is a critical skill; art helps people move from the abstract to the concrete, and back again. As our culture becomes increasingly electronic, and information becomes more abstract, human lives will become ungrounded; human purpose will become dematerialized; and "reason-to-be" will slip away from many. Art can humanize existence and add sensitivity to the physical world. For art deals with both the abstract and the concrete world (Clements and Stueck, 1983).

The student constructions were often comfortably parallel, but, on occasion and with much consternation, overlapping. The curriculum objectives followed the pattern of construction, in that, the objectives were grounded in the flow of action. With even more preliminary preparation, the lessons of how man manipulates the earth for his use could find an awakening in the children. Specific lessons on agriculture: (soil health, terraces, dikes, irrigation and dams) could easily be produced on a large scale. Lessons on earthlodges, earth sheltered houses and foundation excavation would relate directly to the Georgia Social Studies curriculum. Construction of fortifications, trenches, earth forts, bunkers, underground shelters, and moats, could be researched and modeled. Archeology could be examined through the use of "practice digging sites," using techniques of shoveling, trenching, cleaning, placing, and charting. These areas directly integrate with Social Studies at all grade levels, they also

Illustration 29**Barnett Shoals Elementary School****Athens, Georgia 1980****Earthworks**

In elementary schools special events often center around sports field days and PTA fun fairs. The Earthworks involved the entire student body of 500 children. Each day shifts of students would change into work clothes, grab shovels, buckets, and trucks, and proceed to dig. Totally self motivated with great enthusiasm construction continued for two weeks. Showing student participation in changing the environment, this is the closest to an adventure playground the researcher was able to facilitate in the public schools.

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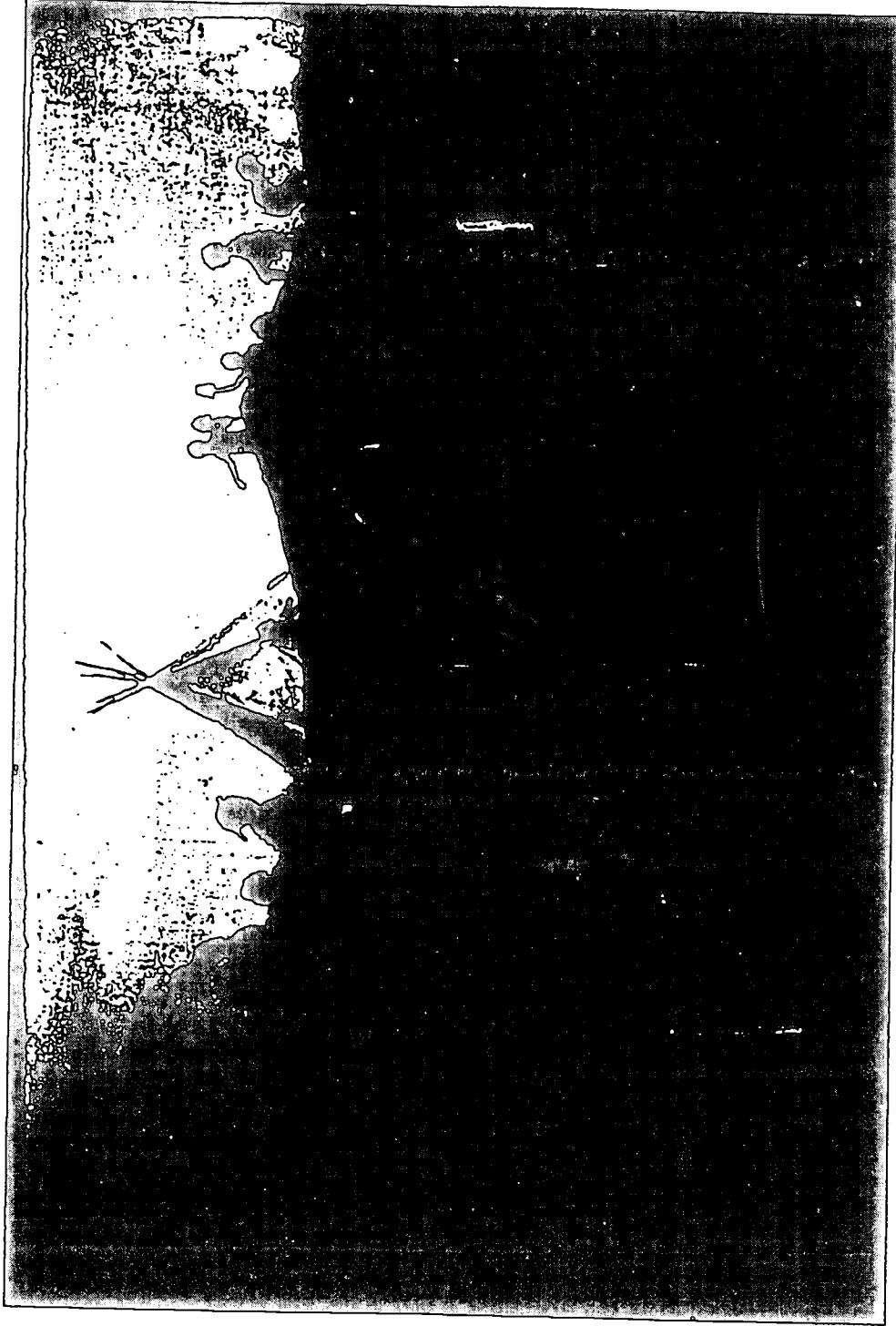
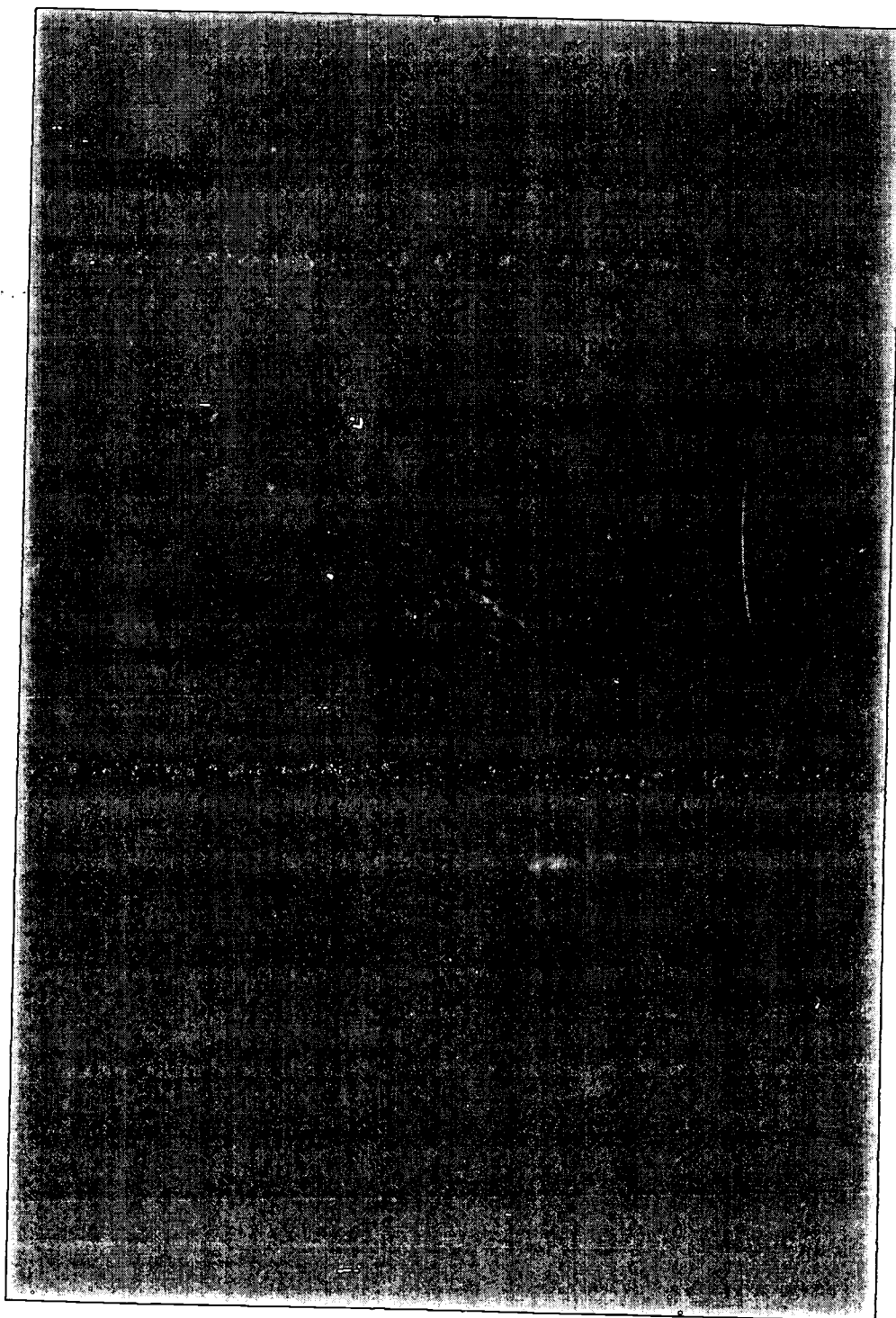


Illustration 30
Barnett Shoals Elementary School
Athens, Georgia 1980
Earthworks - detail

Never before in this researcher's experience had school children been allowed to get so dirty. The children probably thought that the adults had finally come to their senses. No need for the adults to motivate the children to be creative or get to work. Laughter, social interaction, teamwork and reflective moments arose spontaneously during the play. The opportunity to dig in dirt, missing both in housing projects and apartment complexes, was given to all the children during this research project.



link to basic mathematics skill development through their use of measurement, scale, and engineering (see Illustration 48).

As with all the environments presented in this chapter, the Earthworks represents the researcher's primary objective - an integration of the interest of the children and the content of the curriculum brought together through the power located in the three-dimensional form. In this case; no shoes, no workbooks, no teachers-just continuous, arduous, autonomous interaction with clay.

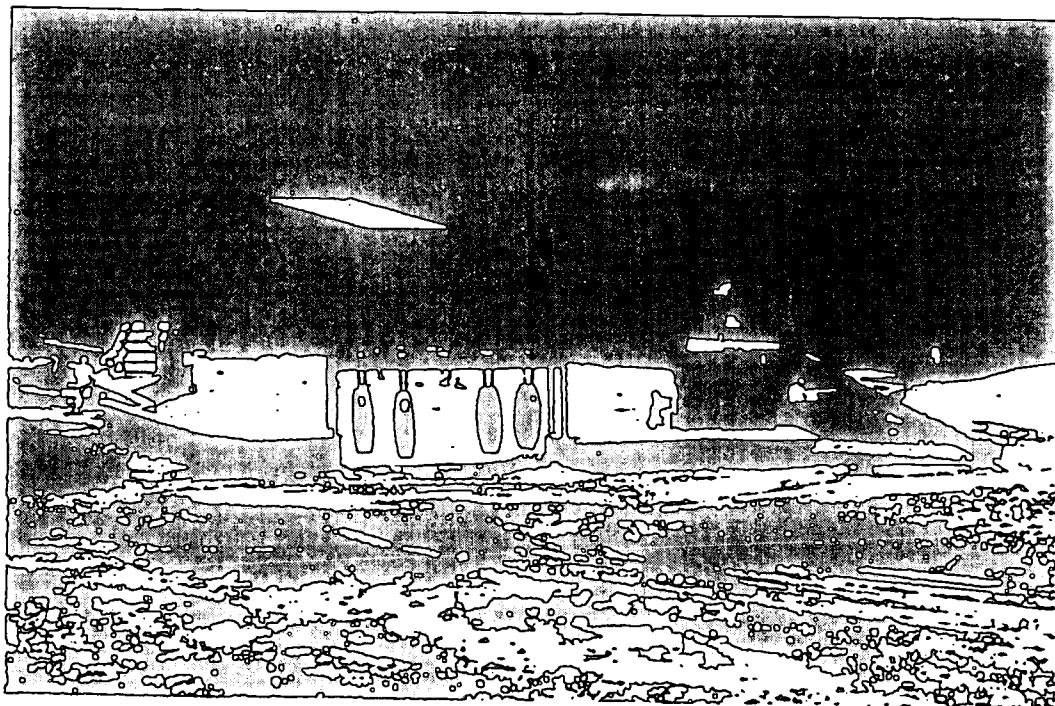
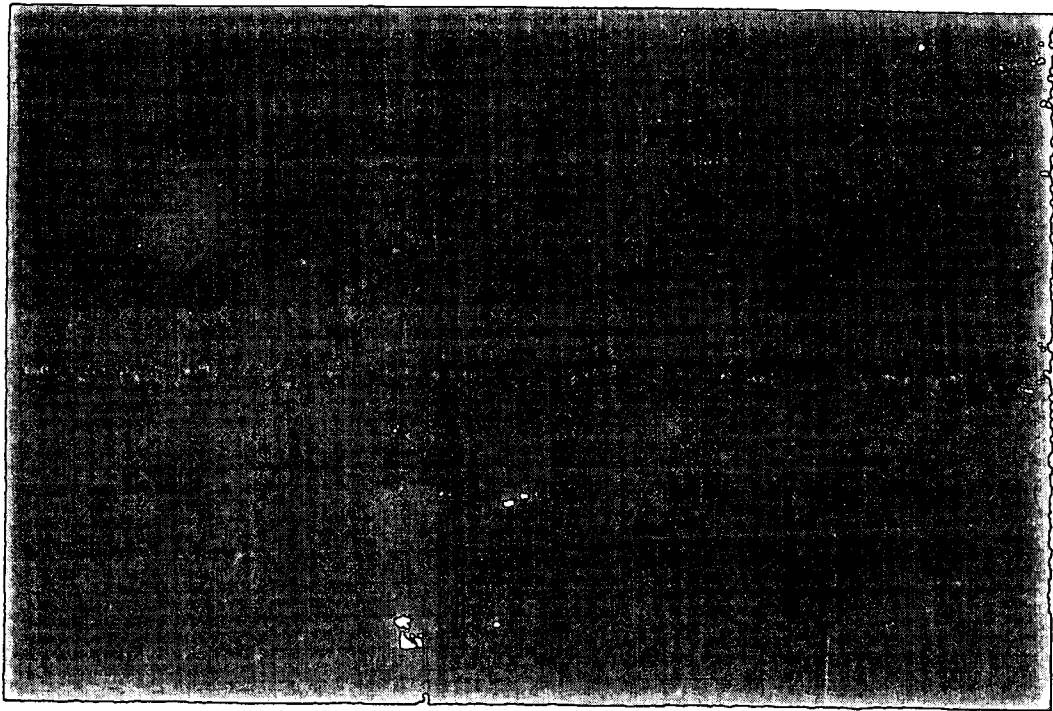
Novel engagements with elements in the environment are self-reinforcing and sustain the behavior leading to new knowledge. People do not need extrinsic rewards to engage with and learn about the environment. Since the specific responses necessary for the survival of a person cannot be defined, Earthworks, as a play medium, fosters individuality with the content determined by the children.

The author, hired to build a second play environment for Fowler Drive Elementar, presented a plan for a scale model of the principle roads, rivers and structural features in Clarke County, Georgia. The county line is a wall with a bench on top, the major entrance roads into the county have play features over them; Horizontal Ladder over the Atlanta Highway, Arch Bridge over the Macon Highway, Rope Swing over the Commerce Highway, Truck Tire Tunnel over the Lexington Highway. In addition a car storage building with a slide off the back side was built next to the eastern border, and a workshop with a lookout platform over it was built on the western border. The roads are 4" wide concrete scaled for matchbook cars

Illustration 31
Fowler Drive Elementary School
Athens, Georgia 1986
The Map

This seventy by forty foot map creates an intermediary scale between little paper maps and reality. The transference skills required to relate and locate oneself to the world are developed during the elementary school years. By playing all over the county it is hoped the students will begin to conceptualize the relationships of the parts to the whole. The important civic and commercial buildings are located on the map: schools, fire stations, government buildings, and malls.

The storage room under the slide seen in the lower photo held toy cars and trucks. It also was to hold sets of hand tools, unfortunately the second week the wallboards were pried off and the cars were stolen. The building in the back is the workshop where the children can build more buildings to place around the map. A proposed lesson is for each student to build a model of their house and locate it on the Map.



and trucks, the major buildings are color coded about 6" high made of 6"x 6" and 4" x 4" wood. The space between the roads and rivers is sand and grass. It was designed where the students could use the shop to build additional buildings, locate them, and add them to the map. Curriculum was suggested in land use, historical development, location of services, the use of the road net, growth of the city etc. This was not adequately taught to the teachers, their familiarity with the hand tools provided was not sufficient, and the check-out policy on the toy cars and trucks was never satisfactory.

The line between play and learning is not firm in the Georgia Quality Based Education objective standards. The researcher's lesson from the Map concerned the gaps between theory and practice. The line between the way the material is supposed to teach and the way it actually teaches must be bridged by the teacher. Because a new educational material was added without instruction or a training manual being provided, very little use was made of the Map. As with computers, the 3-D Learning Environments it was found, need software as well as hardware.

Children come to understand geography by pattern recognition. Computers understand everything through numbers, the processes one employs are all quantified for the computer's delectation before anything happens. This numerical conceptual ploy computers use to contemplate reality can paradoxically give us a useful metaphor to use in the 3-D realm.

Researchers studying the effect environments have on children act like the "interface" on computers. Acting as sensors, then

conceptualizers, often the evaluator's role is to abstract numbers from objects and events, presenting them to the research paradigm in specified digital format. Like the computer "interface" they measure and quantify analog information to make it palatable to a digital process system. The metaphor continues by comparing the "virtual reality" generated by the computer with the "statistical reality" generated by public education. The statistic-conjured schools are "virtual realities" whose differences from real ones are pronounced. They exist as complex sets of numbers, driven by organizational ease. The impressive verisimilitude they have with the statistical norm fails to accept the fringes. Intuition, interpersonal, aesthetic, ethical and narrative ways of learning and knowing do not quantify gracefully in traditional statistical approaches.

Adeline Branham, gave the researcher's name to the Board of Directors of the Outdoor Activity Center as a designer of play environments. The director then contacted the researcher to work with Ann Foskey the Center's Education Director on the way they could integrate their playground renovation with an outdoor classroom. Using concepts they wish to teach at the center, the environment focused on the animal habitats and leaf diversity. A central compass and the addition of a walk-in flower and climb-in leaf reinforce the lessons. Animal homes include; a spider web, underground burrow, bee hive, cave, bird nest, and cocoon. The leaf shape floors include; dogwood, magnolia, beech, elm, poplar, oak, hickory, sweetgum, and maple. These are connected by play

Illustration 32
Outdoor Activity Center
Atlanta, Georgia 1987
Naturescapes

Using traditional playground activities of climbing, swinging, jumping, sliding, and crawling plus playground structures of towers, tunnels, hideouts, and bridges; Naturescapes embodies many ecological principles. Six different animal habitats are featured and seven different leaf shapes are the main floors. The lookout is a birdnest, the hideout a bear cave, the rope swing a vine for swinging, the barrel tunnel a cocoon, and the giant flower a place for bees.



equipment as in the Map's county line. The Center's instructors play structured games with the children to teach relationships within these parts. Naturescape was a wonderful opportunity to work with outdoor educators, who see the environment as a teaching media. As with all outdoor classrooms the objective is to create a dynamic, numinous place, a place that evokes wonder and action, a place for the children to generate meaning and purpose. In Naturescapes, the web of abstract ecological information is woven into a material web. When children learn how to use this conceptual web to sense their environment a generative pathway for creating meaning is absorbed

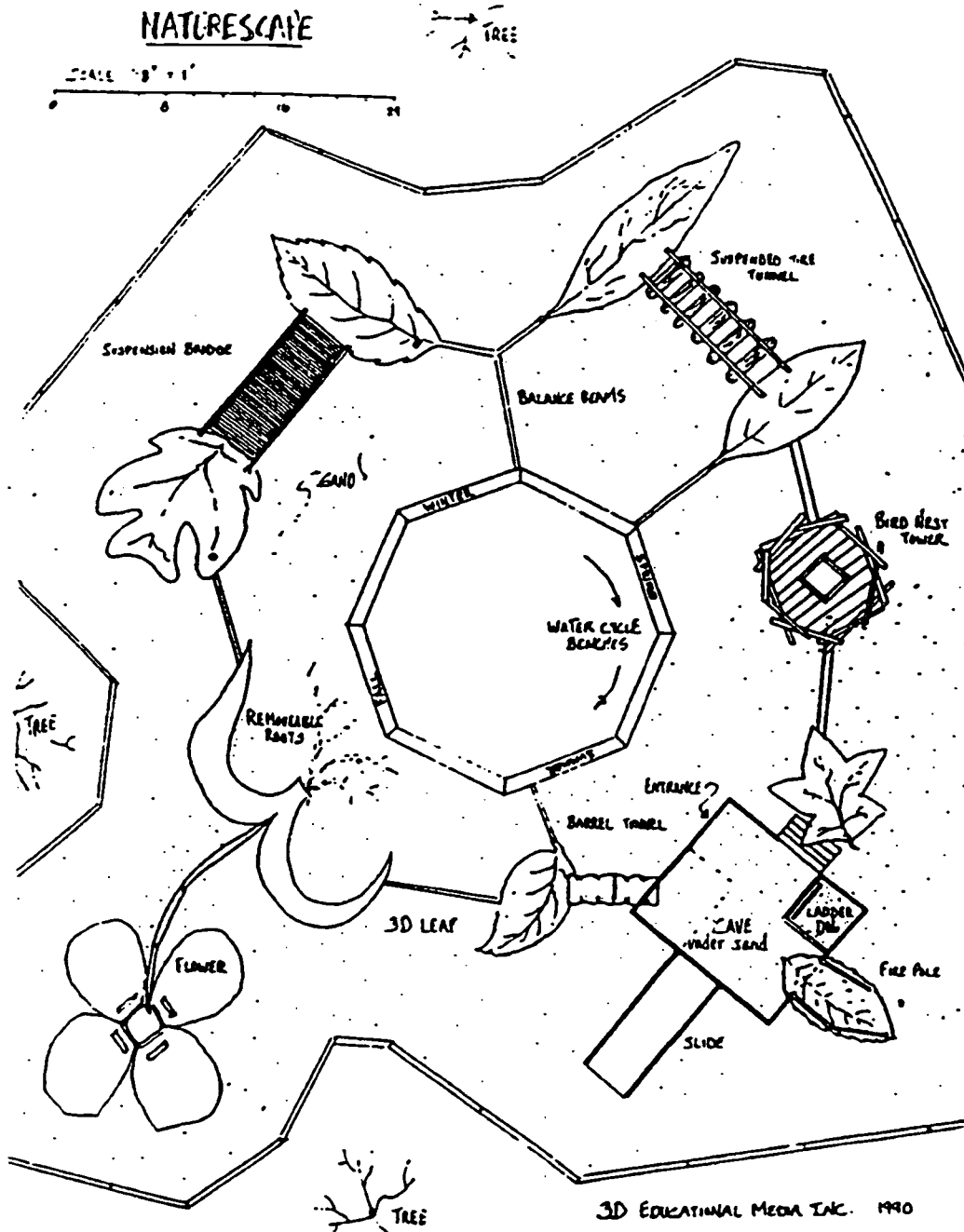
The second version of Naturescapes was built in 1990 for three new elementary schools in Clarke County, Georgia. Nine different trees were planted around each unit to provide beauty and shade. This created an arboretum and shady place to play. George Emerson writing in 1842 before the age of parking lots and highways, proposed design criteria with the child's spiritual and aesthetic growth foremost in mind:

...tall trees should partially shade the grounds, not in stiff rows or heavy clumps, but scattered irregularly as if by the hand of Nature. Our native forests present such a choice of beautiful trees, that the grounds must be very extensive to afford room for even a single fine specimen of each; yet this should, if possible, be done, for children ought early to become familiar with the names, appearance, and properties of these noblest of inanimate things. The border of a natural wood may often be chosen for the site of a school; but if it is to be thinned out, or if

Illustration 33

**Whit Davis Elementary School
Fourth Street Elementary School
Cleveland Road Elementary School
Athens, Georgia 1990
Plan for Naturescapes II**

The plan includes seven trees to create a shady area and begin to grow into an arboretum around the school. The spider web and rope swing on Naturescape I was left off this model due to the need for teacher participation in bringing out the ropes. The leaves are stained shades of green and the veins are routed into the surface. Note the many different ways to move through the space allowing for up to sixty children to play safely at one time. The possibilities of building school environments which facilitate the learning of curriculum objectives is explored with the Naturescape installations.



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trees are to be planted, and, from limited space, a selection is to be made, the kingly, magnificent oaks, the stately hickories, the spreading beech for its deep mass of shade, the maples for their rich and abundant foliage, the majestic elm, the useful ashy, the soft and graceful birches, and the towering, columnar sycamore, claim precedence. Next may come the picturesque locusts, with their hanging, fragrant flowers; the tulip-tree; the hemlock, best of evergreens, the celtis, or sweet gum; the nyssa, or tupelo, with horizontal branches and polished leaves; the walnut and butternut, the native poplar, and the aspen (Quoted in Barnard, 1846, p.132).

Emerson goes on to speak of the flowers and shrubs which he recommends planting around the school. The new Clarke County elementary schools in 1991 cost over \$4,000,000 each and included less than \$50,000 for landscaping. The concrete message given to the children with these budget priorities are stronger than any lessons in books or what we can tell them.

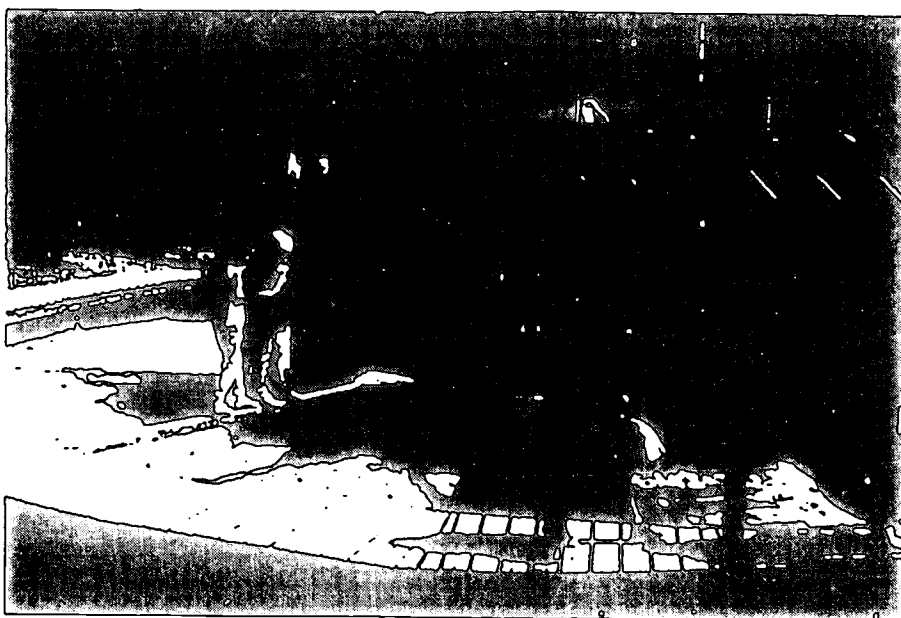
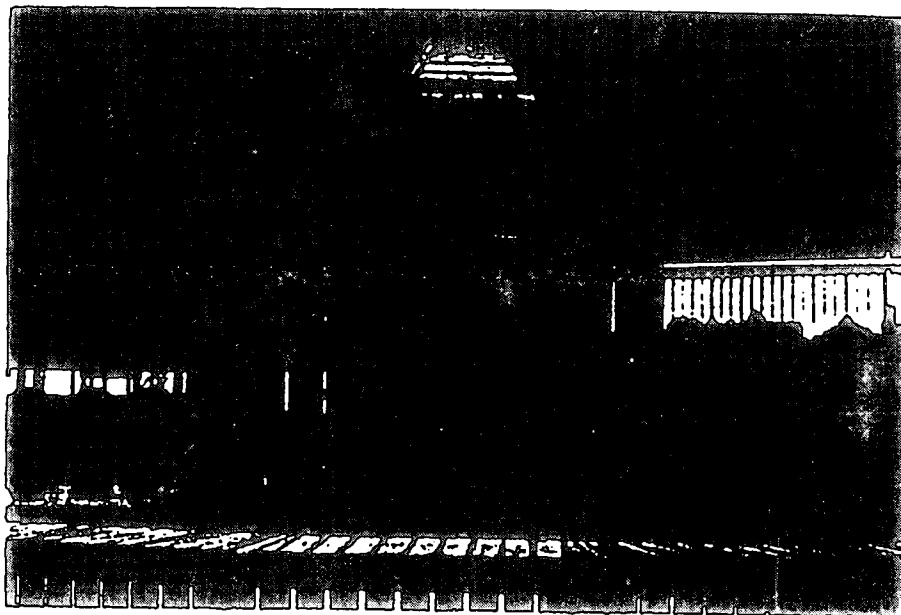
The curriculum of general education for 6, 7, and 8 year olds involves work with differentiation, sequence, symbols, and colors. The author designed a walk-in workbook built around a 47 foot diameter boardwalk which includes; a color wheel, a clock, and a compass. There are in the center common polygons; square, quadrilateral, hexagon, circle, rectangle, triangle, and pentagon. There were modifications on the following two Spacestations in Bethlehem, Ga. and Laurel, Md. which have resulted in the addition of colored windows, other shapes, a storage area for loose parts,

shade roofs, and steering wheels for imaginative play. The Spacestation design was transformed from a central hub to a four-entrance-gate emphasis on Spacestation IV. The use of the color wheel was extended to add a large dose of the twelve colors on the school grounds. It was found those abstract concepts we want the child to learn, often, when given the presence of size and the solidity of three-dimensions come alive for the child and can inspire the imagination. Philip Phenix (1974) asked that we give the students the opportunity to establish meaning from the lessons and activities of school. The activities which the students have been observed in playing and acting on their Spacestation is an example of curriculum which allows meaning to be generated.

Five additional Spacestations have been built using three variations on the original design. In the Bethlehem, Ga. version the center tower has a 16' x 16' roof with high bridges out to the East and West. The Palotti Day Care version in Columbia, Md. is scaled down for 3, 4, and 5 year olds. The three Spacestations in Clarke County Schools, Athens, Ga. have a low center platform which acts as a stage. They also have eight trees planted around the perimeter to create a shaded outdoor theater. The four cardinal gates are built incorporating seating bleachers along with the slide, truck-tire-tunnel, teachers' lookout, and fire-pole. The unifying element on all six Spacestations is the clock/compass/color wheel. The range of variation possible on a basic unit is seen with the modifications on this environment and demonstrates how schools can customize the

Illustration 34
Morgan County Elementary School
Madison, Georgia 1988
Spacestation I

The Spacestation is the first of five variations on the Spacestation design, all include a central hub connected to a compass/clock/colorwheel. The volume of this environment creates a sense of place outside the school which shows the children we care about the aesthetics of their play environment. This unit was funded and built in eight days by the PTA.; the total cost in 1988 was \$8,000.



environment to suit their particular age children, site requirements, and curricular orientation.

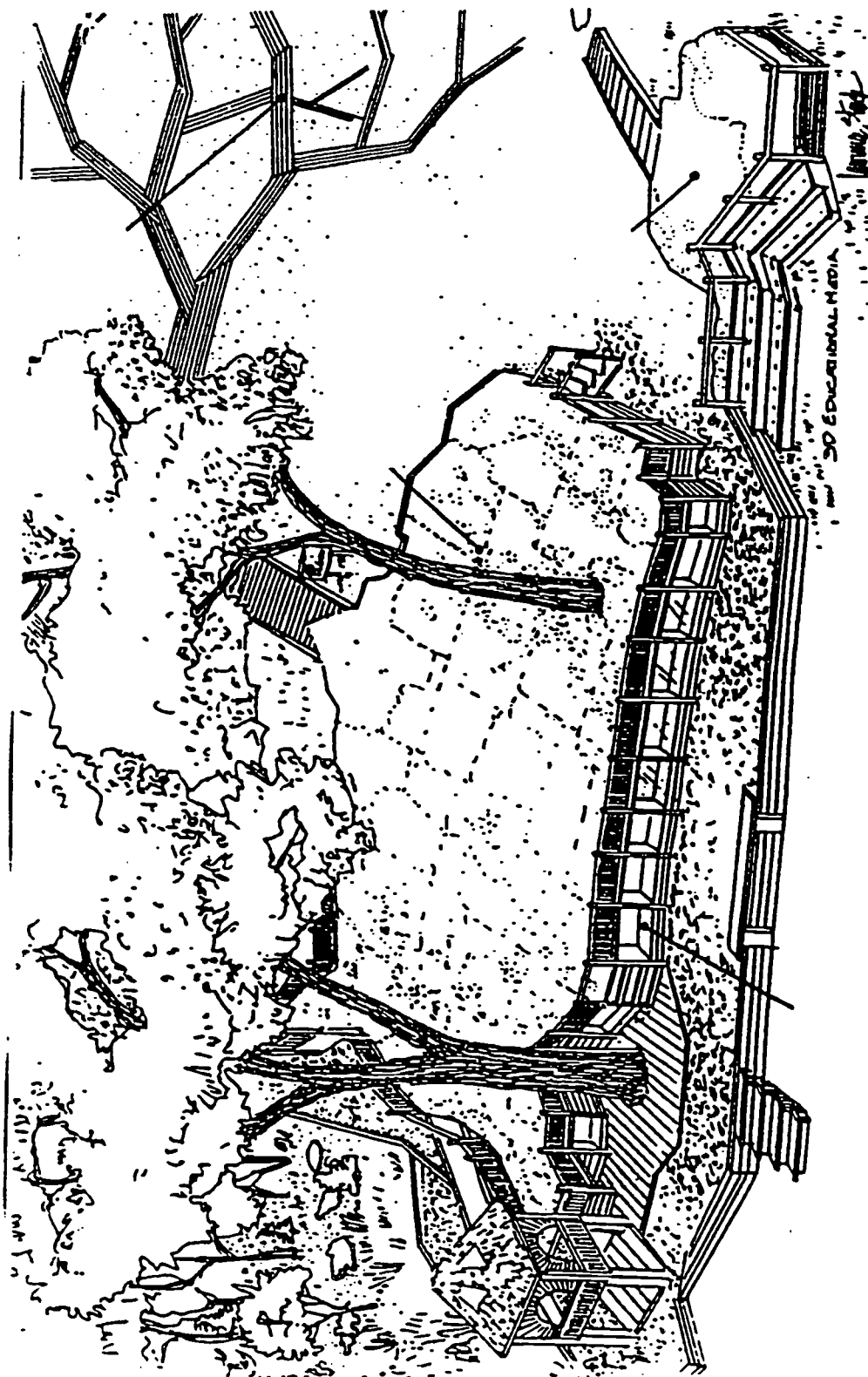
The metaphor of an electrical system is helpful in conceptualizing the school system. Energy is transformed, never lost and constantly on the move, if we overlay this with information theory also operating in a school which assumes information is a resource which is never used up, and on the third layer we factor in the organic spiritual growth of the individual children, we create a matrix which can direct our design of school environments. Viewing school systems with this abstract philosophical matrix led to advocating elementary school facilities radically different from the present designs. The design concepts presented in Chapter Six were developed over the course of this research. They strive to manifest building ideals for a sustainable future and use a decentralized approach in order to support diversity of learning styles, a variety of aesthetic preferences, and a playful manner of design. Earthworks, The Map, Naturescapes and Spacestation are "mediums" where children can develop their own self-image.

The Urban Tree House was initiated as a means to expand the diversity of the United States Forest Service work force by exposing inner city children to jobs in the Forest Service. The project evolved into a cooperative effort with the City of Atlanta, Georgia Pacific Company, U.S.D.A. Forest Service, and various other cooperators. . The author served as a design consultant on the project to find ways of implementing this goal.

Illustration 35

Bessie Branham Park
Atlanta, Georgia 1991
Urban Tree House

This sketch of a learning environment presently under construction, shows a 70' x 40' deck the shape of the United States on which the National Forest are painted. It is theorized, the objective of expanding the urban dwellers understanding and knowledge of the scope and scale of the National Forest will be achieved with this environment. Various instructor directed lessons which are proposed, will be available to the community who use this facility. The researcher theorizes the general lack of national geographical knowledge will also begin to be changed with park facilities like this one. Educational results will be determined by research conducted by the United States Forest Service Southeastern Research Station during the next five years.



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Working from overall goals an action plan for a specific structure is one way three-dimensional learning environments can evolve. Inner city children rarely have the opportunity to visit National Forests and a similiar location frequented by this population needed to be identified to convey ecological lessons. The local park ideal because it is within the local urban neighborhood; it is a recreation site which people visit in their leisure time, and it is a site that can be found in every large urban area. The target population are the future workers living in inner city Atlanta. An additional objective of the project was the education of the urban youth population about the trees and forest of our country. Exposing the urban youth population to the National Forest System was seen as critical to expansion of the image of job potentials.

The initial plan of decks for instruction under the two main trees transformed into a clubhouse, a map of the United States, a shadow tree of the main Water Oak, and a successional forest. Pretest data is being collected to establish base line data on urban residents' knowledge of the Forest Service. After a year of operation, a second study will be conducted to establish the effect of the treatment.

These seven learning environments, along with the playscapes, and City Classroom Curriculum, are the basis for the Stueck Evaluation Matrix. The evolution of this matrix and the Principles in the Design of Learning Environments is circuitous at best. The projects are all based on the children's quest for meaning, the objectives which the culture wishes to impart and the power of the third dimension to bring these together. Play, creation, reward,

pleasure and knowledge are key reference points throughout the research. There have been numerous aspects explored and revisions made in the development of the environments as a result of tailoring to the other aims of the educational systems. These hidden agenda's and null course of action will be explained in Chapter Six.

CHAPTER FIVE

An Educational Criticism of the "City Curriculum"

Objective

The research objective of this chapter was to collect data in depth on the City Classroom. This descriptive research data was collected by observation and interviews of the only third grade class which used this curriculum. An educational criticism, following the methods of Eliot Eisner, will be written to report the observations in the city design, construction and operation.

The goal of evaluational research is to facilitate decision making regarding the relative worth of two or more alternative actions; in this case, the use of the City integrated curriculum or the use of the existing subject oriented curriculum. This study can be seen as a part of research and development effort for new integrated third grade curriculum. This effort is working to develop an effective product for use in schools, based on the psychology of the learner, the disciplines of knowledge, and the desired results.

Statement of Problem

The purpose of this study is to first investigate the effect of the City structure on the quality of classroom climate. The second purpose is to investigate the effect of the City Curriculum context on the involvement and retention of the content of the curriculum.

Background of the problem

The City Classroom Curriculum evolved to create a close match between the learning behavior of the third grade student and the content to be covered. It is based on Dewey's theory that the context in which information is conveyed is as important educationally as the content presented (1940). The following beliefs are central to development of this curriculum:

- 1) That the cultivation of the life of imagination is the aim of general education.
- 2) That when a child wants to learn and when the child enjoys the process, there will be more retention.
- 3) That image making and meaning formation are critical activities at this age (Phenix, 1974).
- 4) That play behavior contributes to the adaptive strategies of the individual (Ellis, 1973).
- 5) That imitation and practice are two of the means children have of gaining and retaining specific behaviors.

- 6) That there needs to be a major emphasis on enjoyment in the school curriculum (Eisner, 1974).
- 7) That aesthetic awareness is a key skill and attitude which our children need to develop.
- 8) That aesthetic awareness leads to an environmental awareness which is critical to our survival (McHarg, 1969).
- 9) That the higher order thinking skills are directly related to the individual's autonomy and willfulness.
- 10) That to elicit and reinforce a socio-drama with all the open endedness of city living will allow the children to move in a learning curve aligned with their developmental curve.
- 11) That allowing the children to generate practice out of theory, they learn to express themselves effectively and build self-esteem.
- 12) That practical life skills will be learned which they can directly apply to their real world.

These twelve presuppositions of the nature of the learner and the criteria of inclusion of material in the curriculum direct the evolution of the City Curriculum. The common goal of all of the presuppositions is to move the locus of control to the student and the motivation for behavior to the player, i.e., an internal vs. external motivation. Motivation is based on unconditional faith in the possibility of realizing meaning through awakened imagination in any and every student. The teacher is critical to this awakening, they exemplify democratic and imaginative qualities becoming role

models for the children. The goal of democracy must obviously be supported by the administration and the instructional staff.

Goal of City Curriculum

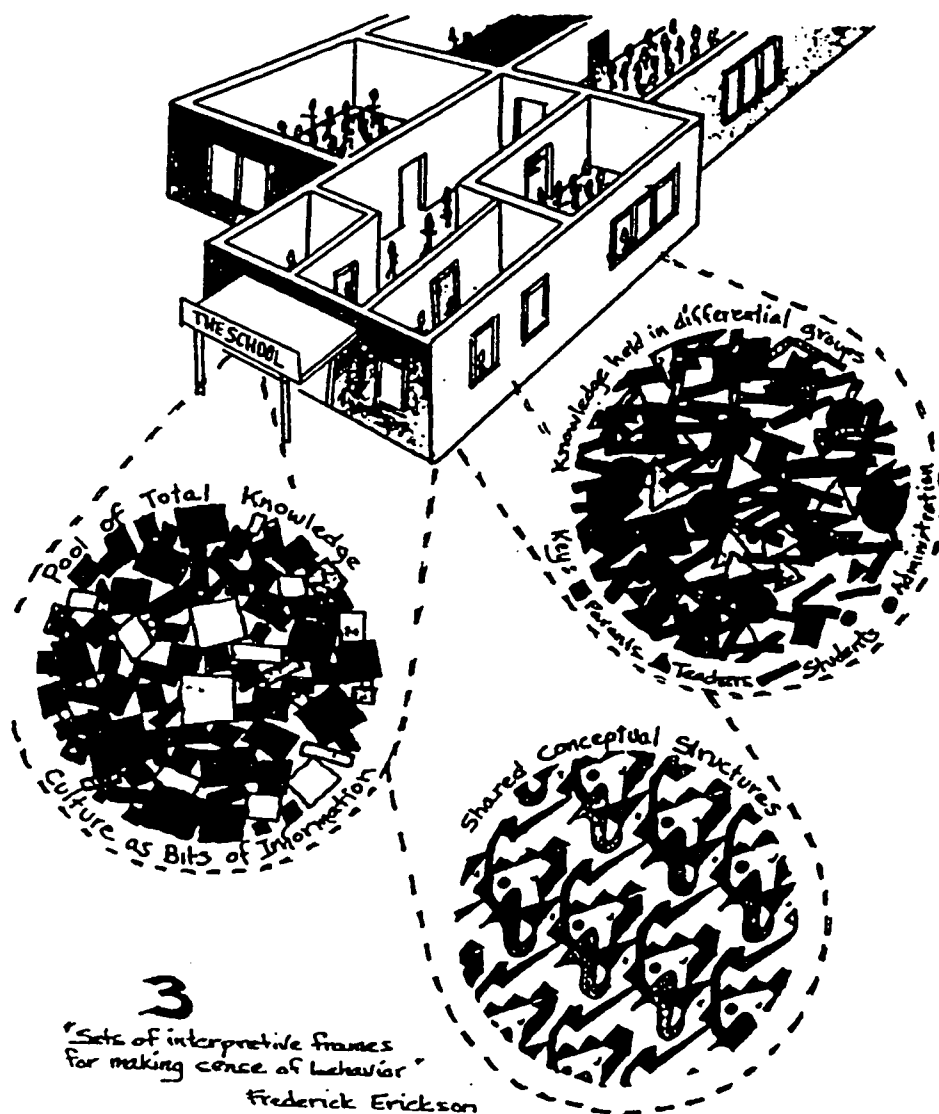
The goal of this curriculum is the development of the ability to deal with change, create meaning, and live within a community. It is based on the experiential modes of learning documented by Dewey in 1915. This educational expression is unfortunately redundant since all activity is "experiential" on some level. Essentially, the City Curriculum embodies an educational process based on discovery as opposed to instruction. This method acknowledges there is a body of information and skills necessary to function in the world. It also operates on the knowledge that there are ethical and aesthetic codes which, while not clearly established, are certainly in existence. The ambiguity of this last design concept is the basic reason for the freedom from specific design in the City Curriculum. The world is not a fixed system, instead it is the sum of the interpretive frames for making sense present at any one time (Erickson, 1987).

We need to develop within the children an understanding of these frames, and the tools to change them to fit their future needs. The City Classroom moves between the needs of the individual and the community to elicit and then reinforce "appropriate" behaviors. It uses the model of the child's larger community to expand the child's understanding of what adults do. This extends to why people do what they do, the effects of those actions, and how they do what they

Illustration 36
Interpretive Frames
Lawrence Stueck 1988

This illustration gives various possible realities operating within the elementary school (Erickson, 1987). It can be perceived in different ways depending on how one views reality . This is why it is important for the researcher to get inside the thinking processes of a population to know why they are behaving as they are.

Understanding these multiple realities also illustrates why using a particular part of a school's population, i.e., the children's reality, to generate data will produce unique results. Alternatively, by filling in a predetermined collection grid's reality, i.e., a test with data, the research will generate totally different results. Education tends to format reality as the left-hand frame indicates, a pool of total knowledge, thus discounting possible vantage points. All three of these interpretive frames operate in schools simultaneously.



Sketch 88

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do. The City allows for as much individualization as possible by not assuming any particular level of cognitive or emotional development for the eight-and-nine year-olds who build the City. Each child is operating from a unique perceptual niche which extends to the direction and tempo of activity, as long as it is "appropriate" behavior within the City.

The distinction between make-believe and reality vanishes during play, thus, the City is operated by the citizens with all their hearts and souls. Each interaction and each process is important, each teaches a lesson and reinforces a thought process. The daily behaviors we engage in become our reality. They, in sum, create our existence, our meaning, and our lives.

One can make sense of behavior using different sets of interpretive frames. Frederick Erickson (1987) gives us three lenses to examine schools: 1) School culture is seen as bits of information which comprise the total pool of knowledge. 2) Knowledge is held in differential groups each independent; students, administration, teachers, parents. 3) There are shared conceptual structures which direct behavior and are unique to a collection of individuals (see Illustration #36). The City Curriculum, like the Foxfire Method, maintains that as educators we are in a position to direct the shape of our shared conceptual structures (Wigginton, 1986). We need to connect the knowledge held by different groups to produce a composite culture, which while not a unified whole is, a healthy one. The City Classroom is not based on the assumption there is a pool of knowledge independent of the participants. All environments are

normative, all actions value laden, and all direction, from above, given without reasons, is undemocratic.

Significance of Study

The field of education needs to have alternative practice to inform theory. With the description and evaluation of the City Curriculum, one such alternative method of education is provided. The differences in the City method and existing curriculum are structural, philosophical, and systematic. Where most existing curriculums tend toward a subject or discipline orientation, the City is a problem centered approach. Many existing curricula see the child as a collection of ways of seeing the world informed by the disciplines, the City curriculum sees the child as a whole self, constructing a unified meaning. Many existing curricula believe the child is in need of external order and direction, the City curriculum believes the child has an inner directed purpose and a drive toward a sense of order. Many curricula believe the role of the school is to convey the existing order and impose a shared purpose on the child, the City curriculum does also. Exactly what that purpose and order are differ between the two. The City Curriculum is founded on the need for us to inform the child about the environment. The City is a collection of representative ideas from many disciplines chosen to economize learning. These fruitful concepts organize the patterns to teach of the love and power and energy within our planet. They show the forces working on the earth and help the children feel and know

about the balance of all the forces, an understanding critical to society's success. Most present systems have as their priority the instruction, via facts and skills, of the symbol systems we use (math, language, maps). The City is grounded in the existential philosophers, the transcendentalist, the romantics, and the progressive experiential traditions. Most existing systems are grounded in the behaviorist, the empiricist, the pragmatist, and the fundamentalist traditions, which are the predominate forces in our society today (Ornstein & Hunkins, 1988). The City is seen as a reconceptualist curriculum with an ideal of being a force of positive societal change.

The need for an ordered scope and sequence is elemental in all the curricula. In the City Curriculum, there is an organic evolving sequence. The scope is inherent in the structure and in the children, and is steered by the teacher and parents. In the City, the parents are involved by the questions generated during the operation of the play. In the existing system the parents are involved by helping their children figure out how to learn the lessons assigned by the teacher. The student likewise is involved in the development of the curriculum of the City versus in the traditional structure in which their input to curriculum development is secondary.

This chapter will document what took place in the City Curriculum and present an alternative to the existing order. Educational criticism is used to illustrate the learning which took place and the factors which directed that learning. The radical transformation of the learning context by the students is only the most obvious

difference in the City Curriculum. The use of time, the direction of the students, and the motivating factors are all significantly different. The researcher, in order to assess which traits the method elicited, observed the students creating this curriculum.

Background overview: Four City Curriculum projects 1980-1990

City Classroom design is a curriculum oriented toward transformation. Eliot Eisner chose Philip Phenix's article "Transcendence and the Curriculum" to include in the 1974 book Conflicting Conceptions of Curriculum. The City Curriculum agrees with Phenix's contention:

That every concrete entity is experienced within a context of wider relationships and possibilities. Conscious life is always open to a never-ending web of entailments and unfoldings. No content of experience is just what it appears to be here and now without any further prospects or associations. (Phenix, 1974)

Ornstien & Hunkins (1988) wrote:

The environments educators design should facilitate students' attending to the experiences and content that they have selected and organized. The environments should stimulate purposeful student activity. They should allow for a depth and range of content and experiences that facilitate learning.

The author's curricular reality sides with an aesthetic rationality. John Holt (1975) points out, "We would have to worry a lot less in

our schools about 'motivating' children, about finding ways to make things happen, if we would just provide more spaces in which good things could happen." "...Space creates activity; it allows students to generate places and moods" (p. 83). The nontechnical-nonscientific approach to curriculum which re-appeared during the early 1970's has come to be known as the open-classroom and was touted as the means of humanizing our elementary schools. Based on an activity curriculum with roots in 1930's activity movement, it is adverse to making any plan in advance that might stifle the development and learning of children. It stresses the subjective, the personal, the aesthetic, the heuristic, and the transactional; focus is on the learner rather than the out-puts of production. It assumes the activities evolve rather than being planned precisely. It focus on individuals' self perceptions and personal preferences, their own assessments of self-needs, and their attempts a self-integration. These are the data points for the curriculum decision making process. These are not new concepts in education. Dewey, in 1915, quoting Rousseau wrote, "We cannot really see, hear, or touch except as we have learned" (p. 12).

In creating four City classrooms between 1980-1990, the author worked with Dolly Davis. Davis taught during this time at Barnett Shoals Elementary in Athens, Georgia. The following educational criticism synthesizes these four experiences. The basic method was followed in all cases using third grade classes. The class did all the construction with adult help. During the fourth City, six parents built the 2"x 4" and plywood superstructure on a Monday and Tuesday

Illustration 37**Barnett Shoals Elementary School****Athens, Georgia 1980****Super City**

Construction of Super City took one month. This was the first of four City Classrooms built under the supervision of Dolly Davis and the Author. Boxes were stacked, plywood floors were placed on top, then cardboard walls were wrapped and screwed to the buildings. Having no previous experience with this type of construction resulted in the entire class building with a spirit of adventure and creativity. As the adults, the author and the instructor, introduced lessons important for the students to learn. Likewise, the construction process generated and exposed to the adults lessons the students wanted to learn.



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afternoon. It was felt, perhaps, to make the curriculum more exportable and replicable, most teachers would rather have adults hammer, saw, and bolt the big boards. The length of time of operation varied from three months to five months. Here again an effort was made to make the project replicable by not using a majority of the third grade year. The cost averaged \$250 with many supplies carried over from year to year. This cost was funded by parent donations, small grants, Dolly, and the researcher. Often, we had three adults working with the children during construction: the teacher, researcher, and a student teacher. Basic construction took between two and four weeks depending on wall material, complexity of the buildings, and elaboration of decor. The last three Cities were built during consecutive years, thereby lending an air of expectation to their construction. Each year Mrs. Davis spent the Fall of the year preparing the children. This preparation focused on behavior acceptable in a complex structure, and lessons on the self-motivation and discipline required in a decentralized classroom. The degree of freedom and autonomy necessary to operate this curriculum was new to all the children. Intrinsic motivation, self-control, and cooperation are three of the behaviors critical to productive city living. The safety of the children took precedence over all other aspects of the City Curriculum. During the four years, two accidents occurred, both from falls; one coming down a ladder, and one off the second floor. These caused no major injuries but served to remind us to be vigilant both working with tools and during operation. The class composition was typical of Barnett Shoals Elementary during

these four years. The mix between boys and girls was approximately 50/50%. The mix between black and white varied from 40/60% to 50/50%. The students' economic backgrounds covered the full range in Clarke County from very wealthy to very poor. The first and second City's walls were cardboard; the third year's City had ceiling tiles and paneling, and the fourth year used canvas. Each material had aesthetic, economic, and maintenance advantages. Overall, the free large cardboard boxes were the most flexible, ridged, and manipulable. The canvas was the brightest, best to paint, and the most expensive. The number of students varied from 22 to 26. The number of buildings ranged from four to six, and their sizes ranged from 8' x 8' to 3' x 3' in a dozen different configurations. Likewise, the location and arrangement of the buildings changed from year to year. Advantages accruing from any particular arrangement, number, size, or type could not be separated from the unique composition of a particular class. The room was 25 feet x 28 feet, 10 feet high, with one three foot door in the corner, two 30" wide windows in two other corners, a large chalkboard, bulletin board, storage cabinet, and a counter with a sink, ran the length of one entire wall. This was a simple room representative of generic rooms for schools built between 1960 and 1990. The Fire Marshall was always consulted, shown the location of the fire extinguisher mounted especially for the City, and shown the exit paths from the offices. As codes and marshalls changed during the decade, the City became a greater variance for them to overlook. In 1991, the order came, after the open house, to dismantle the City due to regulations.

The name of each City was chosen by the builders: Super City, Mini-City, Kidville, and Littleton. For the purposes of this criticism the terms City or Mini-City will be used. Anecdotes and sequences from all cities are woven together to give a picture of the events possible in a child-centered three-dimensional curriculum. The researcher is referred to as Lawrence. The teacher is referred to as Dolly.

During the Winter and Spring of 1990, Dolly Davis and her third grade class built and operated a city in their classroom. Using a participant-observer qualitative research design, the researcher collected data using field notes, recordings, photos, and video tapes. Acknowledging researcher bias is a major factor in the rendering of this type of research; the Educational Criticism method is designed to give the reader insight on that facet.

Eliot Eisner, in The Educational Imagination: On the Design and Evaluation of School Programs (1979), gives ideas which deal with the functions and character of educational objectives and the methods that appear useful for evaluating the character and effects of school programs. He attends to the other aspects of the school that are as important as the formal curriculum. The attention given to significance of behavior takes this study into the field of Educational Evaluation as a sub-set of Educational Research. There has been a tendency to fit educational problems into forms that fit research paradigms. Using Eisner's methods of Educational Criticism, the author evaluated the effects of schooling, recognizing the difference between what students will do and what they can do.

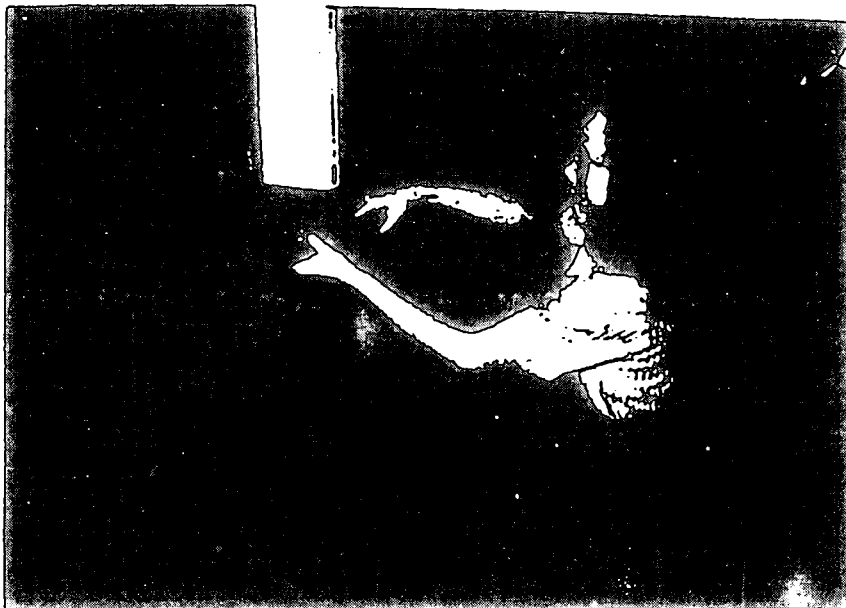
Three types of educational objectives which were observed; instructional, expressive, and problem-solving. Instructional objectives have their rationale in knowing what it is that a student is able to do in order to determine the effectiveness of the curriculum. Expressive objectives result from an activity planned by the teacher or the student which is designed not to lead the student to a particular goal or form of behavior but, rather, to forms of thinking-feeling-acting which are of his/her own making. In the third type, the students must bring their imaginative resources to bear upon a specific problem that makes possible a wide variety of solutions. Most community problems are of this sort, they need to be appraised by a variety of criteria, cost, aesthetic considerations, space limitations, skill level, and time constraints. It will be shown the roots of aesthetic education run deep throughout the City Curriculum.

After Christmas Vacation, plans for City construction were begun. Anthony and Frederick were very excited in that they knew what jobs they wanted. After touring the city last year as second graders they also knew what they wanted their building to look like. Dolly Davis and Lawrence Stueck began the introduction of the project with an overview of the sequence of events. Melissa voiced a misconception shared by Sally and Tyron as to who builds the buildings. It was explained by Margaret, the kids each build their own buildings. Her brother was in the city two years ago, and she had very definite ideas about the process. Lawrence talked of the size

Illustration 38
Barnett Shoals Elementary School
Athens, Georgia
Mini City

Two scenes from the construction of the City. Driving and pulling nails, plus sawing wood were favorite activities. The fourth City was predominantly bolted and lag screwed together to reduce construction noise, and simplify saving the wood for later years. Bolting made for more drilling with the brace and bit plus the use of wrenches. The all time favorite tools were the socket wrench with its sound effects and the tape measure with all those little fraction marks.

The lower picture shows three students working together sawing; the saw horses, in this case chairs, were plentiful. In four years, no serious damage was done to school furnishings, nor were there any serious injuries from the use of the tools.



and diversity within a city telling the eight-year-olds who live in a city of 50,000 that there are cities of only 26 people in their state and in fact all large cities like New York, Atlanta, and Miami once had only a few hundred people. He also said that all the basic activities of cities around the world and throughout time are similar and will take place in mini city (with a couple of notable exceptions). The following was the lead-in conversation with a third grade class, on the design of cities:

What does your father do?

What does your mother do ?

What do your neighbors do?

These are questions to be answered in the following lesson.

We need you to know these answers because we need you to understand your culture. It is made up of structures both physical, mental, and spiritual. These three realms are themselves constructs which are agreed upon to differentiate the continuous whole of our reality.

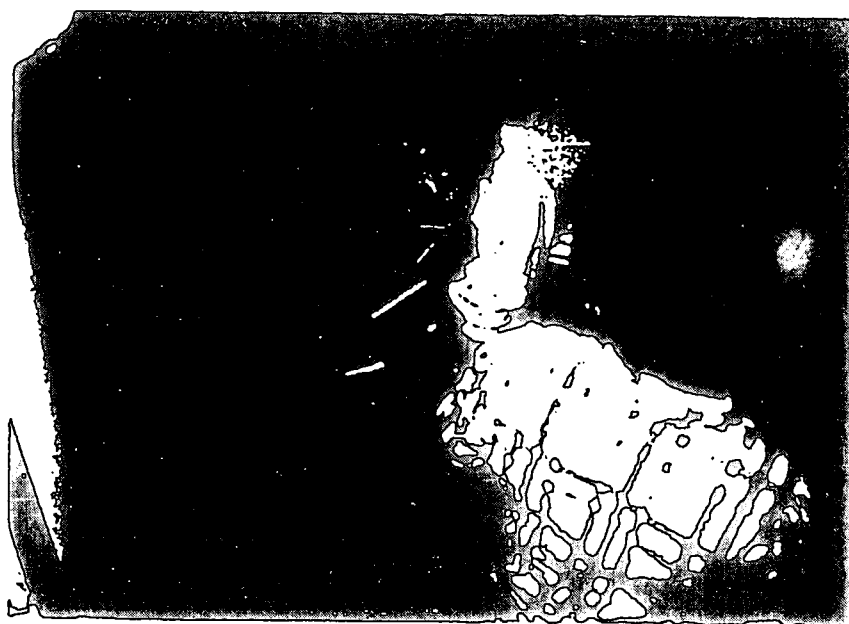
There is a good chance the adults around you "do" a job which is a service or produce a product which you use. The Yellow Pages of the telephone book + the 3-D Map equal one method we have devised to help you learn about your community. Many of the jobs are of obvious use to you; others will need explanations because of their abstract qualities. The jobs have all evolved during the development of our culture, they all fill a niche, they all have a purpose. We hope you will gain an understanding of

what goes on in all those building in your county and of what all the adults are so busy doing everyday while you are in school. Hopefully, then when you grow up and pick a job it will be with insight and pleasure. One last thought, this unit is still in the research and development phase. If you have any changes to offer, please feel free to tell your teacher.

Dolly told them about why she chose the City curriculum to teach Social Studies. She also explained how Science, English, Art, and Math would be used and taught in the operation of the City. Mark asked if he would still need to do his math sheets, Chris laughed, and Tiffany hit him to shut him up. Leslie, trying to put together if she would have to do her spelling words told them both to stop it so she could find out more about the City work. At this point Dolly, called order, moved Tiffany to the back, and gave the first of numerous warnings that the City was optional and would only be built if the class showed maturity and self-discipline. Basic rules of conduct would still be observed starting with only talking in a meeting after you had been called on. Secondly, looking at Tiffany, she repeated the important rule for group cooperation, "You are to keep your hands to yourself." Dolly called on Gretchen, who asked, "When do we start building? Can I be in Ann's building? Can I be a veterinarian?" Typically, the children had multiple questions. "Patience," Lawrence said, "We will be explaining all these things soon. Keep your feet to yourself, Joseph, or you will be out in the hall. Hold your questions until after we explain the pattern."

Illustration 39
Barnett Shoals Elementary School
Athens, Georgia 1990

Measuring, marking, and sawing the various parts of the buildings were popular activities during construction. The time it took to cut off the spruce 2" x 4"s varied from one to ten minutes. Most children would stay with the task until their cut was complete. Of course, the best sawers often cut the majority of the boards for a building. There were some children who never cut a board, there were few specific participation requirements in the construction phase. In four years, there was never a serious accident during construction. As with most practical life skills, practice is the basic means to success. With the rush to linguistic and mathematical skills, school curricula often abandon the prefaced goal of a balanced development.



Due to all the questions it became clear all the morning's lessons on city design and job diversity should wait. Dolly proceeded to outline selection of individual jobs, their grouping into categories to fill buildings, and how each group in a building would then design and build their building. She said, "Each of you take out a piece of paper and write down three jobs you would like to do." J.P. came up and said he couldn't think of three jobs. Dolly told him to write down three buildings he went to in town. He wrote down Burger King, Macdonald's, and Wendy's. Malcolm had Gretchen and Phyllis laugh at what he had written. A classic teacher discipline option was brought up, to send him out or bring the situation up to the class. "Malcolm," Dolly said, "Please read what you have on your paper to the whole class". Red-faced he read, "Video Rental, Krogers, Party House". Realizing "Party House" work could open a vast chasm, exposing many of this class to subjects half the class had never heard of Dolly used an end run. She suspected even Malcolm had only a rough idea about Party House work. Dolly replied, "Those are places, Malcolm, not jobs."

There was a pause, Dolly and Lawrence looked at each other, half the class picked up on the energy, the pause got longer, even Derek and Leslie in the corner became quiet. The magic circle became complete, everyone realized this was not school as they had come to know it. New rules applied, the teacher did not know everything that was supposed to happen. Suddenly, the children became part of the process. There was a shared reality that each and everyone was going to create this City.

Ann laughed, the moment was broken for now, it was lunch time.

After lunch, Dolly explained:

"School work as they knew it would not cease to exist. City work would be added to it. When all their assignments were complete they could work on City projects. There would be time after lunch when everyone would operate the City, this was a privilege, not a right, and it was at all times subject to proper behavior and completion of their school work. Just what the City would look like and act like was up to the people in the City."

Lawrence began a discussion on the difference between plays and real life and about the difference between the classroom City and the City of Athens. Thinking about the line between pretend and not pretend. Margaret said, "If we do real work in our city, and it is a real place, then it is not a play, and we are obviously not playing." She had a way with big words. Derek argued, "If this is not a pretend city, and we do real work, then it won't be any fun" Dolly walked the fine line between "fun play" and "fun work" often in her class. It was very important to Lawrence, knowing the relationship between playfulness and creativity, for the children to have the spirit of playfulness while in the City. When they perceived their activities as work which they chose and directed, they were totally involved and very creative. However, when they perceived the adults had an agenda and a series of projects for them to learn, their motivations changed. The power of the City Curriculum was this transference of motivation to the intrinsic side of the children. Three

of the context specific curriculum goals of the project were: self-direction, creativity, and self discipline.

Dolly closed the day explaining:

Many of you have questions about what job and building you will be in. We will continue with jobs and building assignments tomorrow. Tonight, I want you to have your parents help you write your three job choices and then beside them write what building they would be in. For example if you are a fireman you would work in the Fire Station.

The next day friends began comparing job lists and asking to be in the same building. Two parents had called Dolly that night requesting their children not be in the same building as their best friend. They were concerned the children would not get their school work finished. Another had called asking if there had to be a City built, her daughter was already behind and all the commotion about the City would confuse her more.

This was typical, every year not only had a small percentage of parents been fearful of the apparent disorder of the City, they had also been skeptical of the benefits for their child. In the four years the City was built, most parents expressed pleasure by the end of the project, in the opportunity their child had and none reported the City experience to have been a disappointment. Likewise, with the students, each year there were a few non-believers and a couple who could never learn the self-control needed in such a self-directed classroom. For the majority, the weeks spent in creating their City lent a new dimension to the reality know as public school.

That first week the author put up the Yellow Pages wall paper. All 289 pages of the local Yellow Pages were laminated and stapled on the wall. These list of available jobs could be easily referred to and lent, an image of the range of jobs in the City of Athens to the room.

With 23 jobs listed, the students revealed various overlaps and various comprehensions. Dolly began to implement a little "Federal-decision-making". Whereas, the children became the City government; the teacher became the metaphorical State and Federal government. The following day, there was a discussion of the difference between jobs and where the jobs took place. This dimensional difference was unclear in the children's mind. When questioned about Wendy's, specifically, they could identify the cook and the cashier, yet on their job sheets they seldom wrote "cook". For example, the teller in the Bank is the most graphic image of who must own the Bank since that is who takes and gives out money. The discussion moved into the larger categories of what takes place in a city. Goods and services move around; money is exchanged; letters are sent; teachers-teach, Doctors-doctor, Police and firemen, trash and street crews, construction and maintenance workers were obvious. Lawyers and judges do things, and the government does things down at City Hall. Just what some of these less concrete operational professional people did was anyone's guess. Key jobs such as real estate sales, insurance sales, factory work, and church work were outside their desired reality for the most part.

The key to teaching how all these jobs integrate was to begin within each child's reality and then to build a mental image by dimensions with an expanded reality. Sylvia Ashton-Warner, in her book Teacher (1963), wrote of using the readiness found in the child's current reality to teach reading. Thorndike (1913) documented how important both readiness and openness to learning, are crucial for retention of skills and knowledge. With our logistical need for grouping by abilities and the introduction of material in proper scope and sequence as it relates to a subject not a student, too often the information is out there but there is not the emotional and cognitive framework established to retain it within the mind of the child. The principle which the City Curriculum is designed on is the development of an environment where seven different ways of knowing and five different curriculum conceptions could operate in parallel (Eisner & Vallance, 1985). This of course is not totally possible. Like a real city where multiple realities are in operation side-by-side, the Mini-City is a forum or stage for a diverse educational experience.

It was determined there would be four buildings this year. Each was to be 8' x 8'. Thus with the adjoining town square and streets the entire room was filled (In other years with smaller buildings there were up to six buildings). Each building was two stories allowing eight logical divisions of jobs into groups.

Food store - Ted and Tina

Restaurant - David, Julie, Bryan, Phyllis, Ricky

Store - Mark and Tom

Veterinarian - Leigh, Sara, Joseph

Lawyer - Will, Jay, Mike

Police - Bob and Tammy

Bank - Randy

Post Office - Ann and Amy,

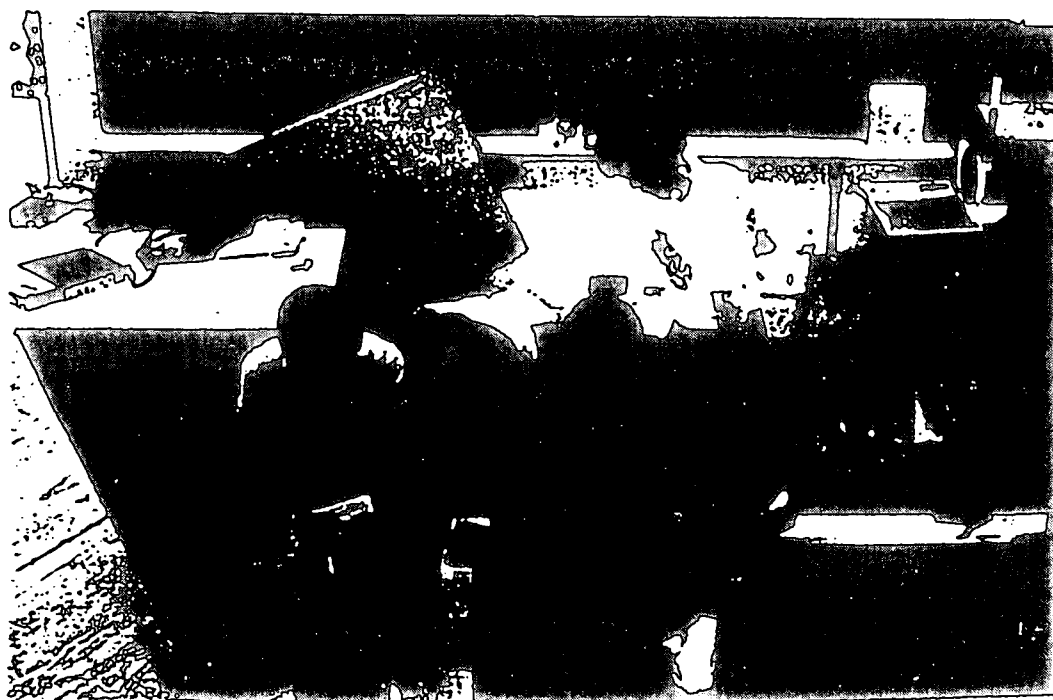
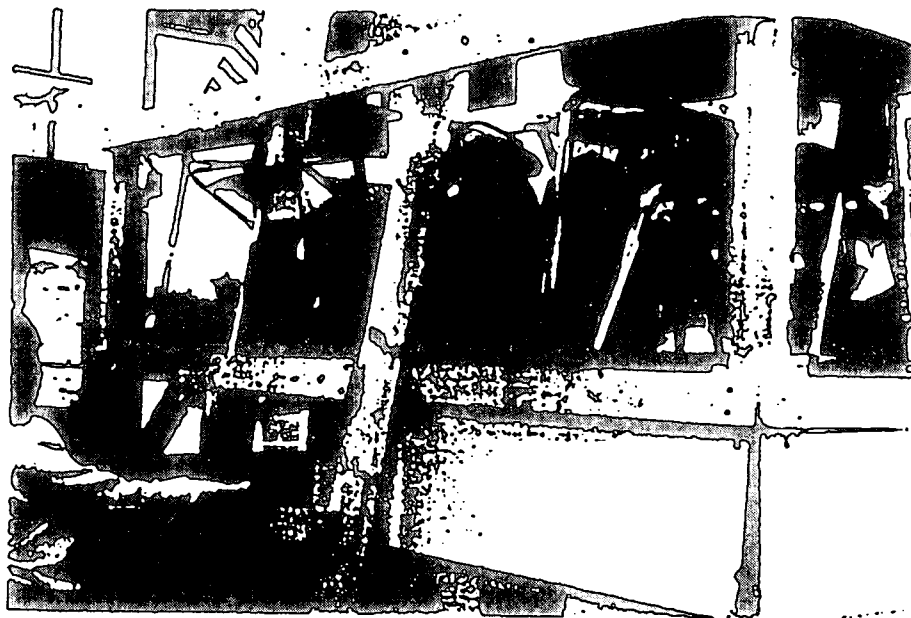
Unassigned - Tina, Leslie, Linda

There was a case of government intervention and coercion by the teacher on the type of buildings and on job assignments. It was felt the Post Office plays a vital role in moving information in our society; thus the teacher felt that it needed to be built even though no child had requested it. Two jobs which were not selected by the students were presented by the teacher. The Newspaper and Television Station had always been favorites in past Cities. They were presented as part-time second job possibilities, for those interested. Similarly the Phone and Electric utilities are very important in the life of a city and were added and then staffed by workers.

The critical role of the adults in this curriculum was to monitor all activities, redirect inappropriate behavior, and expose important lessons which the children failed to perceive, in general to act as the benevolent monarchy. The adults strove to expose the patterns and relationships of the seeming unrelated parts of the real world to the discreet parts of the school curriculum. Finding the opening within the individuals consciousness is the role of the adult in the City Curriculum. The concept of "teacher" is expanded to the entire environment which does the teaching. That is to say, the other children act as "teachers", the structure "teaches" and that distinction

Illustration 40
Barnett Shoals Elementary School
Athens, Georgia 1990

Many activities occur place simultaneously in the City. Here one can see the advantage of having one's own floor space on which to lie down and read. The ladders were a favorite part of each building, they generated usage laws, enforced by the court, to insure their safe use. Below is a photo of the author in green plaid shirt, demonstrating the layout of a wall section. After the first building was up, it was used as a model for the others. Note the close proximity of the reader in blue shirt, to the construction crew, illustrating that the children often drop into their own mental space in the midst of great confusion. The aesthetic order of a City Classroom on first impression is overwhelming to many adults. In an environment where the teacher cannot see or hear all the children requires a higher level of self control and self discipline is required from the children. The vast majority quickly mature in these skills in order to keep their City.



between teach and learn is merged. As patterns replace lists and catalogues, learning and remembering of parts remain necessary conditions of learning, but cease to be sufficient conditions. A new flexibility is required, a capacity to deal with the roles of things, as well as with things as such, and to understand the relations among roles.

The "role of things" in Mini-City is directed in different ways on different days. As was amply shown when the Judge was going around stirring up trouble then telling the Police and the Lawyer, in order to drum up court cases. It was seen when the Bank was robbed, by a citizen who was to have his toys reprocessed and needed quick cash. How could these have been written into the curriculum? Different situations arose each year. Each year had numerous opportunities to discuss ethics, proper behavior, and good citizenship. What was unique to each classes discussion of this realm was their vested interest. Certainly, what sentence to hand down to a convicted criminal was a topic of hot debate when that criminal was a classmate. Relationships of parts to the whole as embodied in concrete individual classmates helps to involve the students in the abstract concepts traditionally taught about city living.

Dolly divided the entire class into four groups. Each group did a scale drawing of the room (1" = 1"), then added all the existing apparatus and fixtures. This was good exercise in using tape measures and converting real things to flat images. The three new 8' x 8' buildings were cut to scale from cardboard and located in the drawing. Class discussion was held on the alignment and location of

each building. The Restaurant/Food Store was by the back window. The Mall across the street on the other side of the sink. The Post Office/Hospital was next to the door. The Bank/Law Office was to occupy the existing loft. The Police Department was in the rear of the Bank, an obvious location to the class.

The structure of Social Studies has commitments about the nature of the subject which serve as guides to inquiry. For instance, just who is included in social/economic groups, what constitutes progress, and how short is short term gain. All ways of knowing develop lenses and concepts to frame reality. Also Social Studies has a syntactical structure, which is the pattern of its procedure, its methods, and how it goes about using its conceptions to attain its goals. These components transcend the "parts", thus an election of mayor complete with campaign managers, posters, speeches, promises, etc. leads to a richer understanding of government than memorizing the job classifications and descriptions of local governmental bodies.

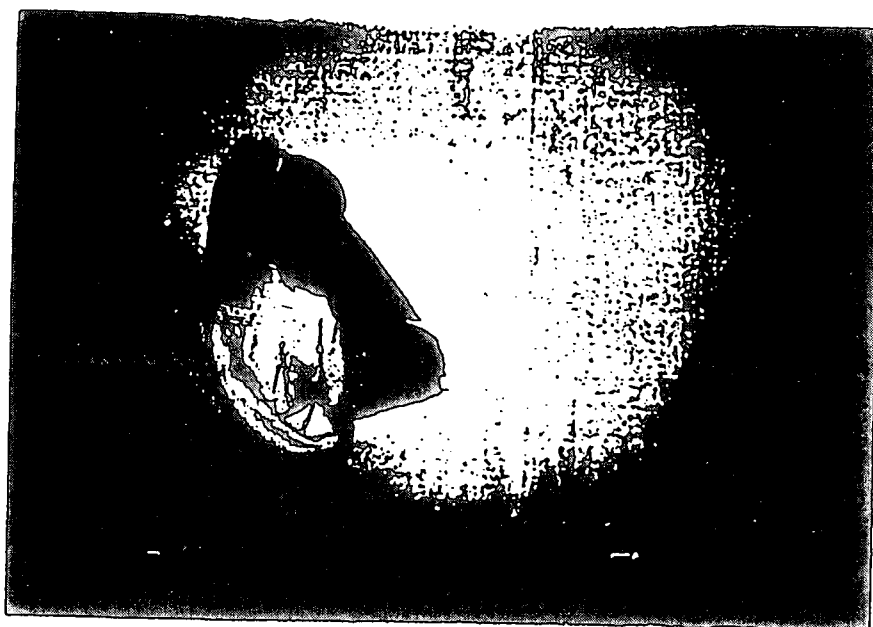
By the third day, work had begun within the building groups on design of the facades. The locations were decided for the three new buildings, the fourth was to take over an existing 8' x 8' loft. The only criteria given by the "state" building inspectors, Lawrence and Dolly, was that rectangular windows would not be allowed. In an effort to expand the range and imagination of the builders, it was found this simple exclusion opened the way to dozens of interesting and functional fenestrations. The Bank personnel opted for such small windows that little "sun" light from the ceiling reached the

desk downstairs. The bankers brought in lights for their desk. In time they enlarged the Teller windows affording a view of the street activity. The Post Office personal on the other hand cut such large windows the integrity of the cardboard walls was impaired and no privacy was afforded, such that they were bothered by traffic and ended up "bricking" some of them back up. In general, negotiations between upstairs and downstairs tenants generated integrated facades. The Restaurant had many different size and color bricks depending who was "laying" them and what color they liked. The Bank was replete with such horrendous graffiti that the other citizens forced them during a town meeting to organize their painting such that it did not diminish the atmosphere of the town. J. P. put it succinctly, "That is an ugly building." Jay and Chris had to admit they had gotten carried away with painting a picture with cartoon images and forgotten it was the Bank. Typically, at different times during the forty days of operation, students forgot this was school and dropped into a full play mode. By the second week there were town laws to control this abandon and maintain order. Even though traditional rules of classroom behavior could not all apply, it was obvious one could not run through the streets of town playing tag. One could not drop books out of the second story windows onto other folks. Generally, self discipline and peer pressure combined to lend order and purpose to the apparent chaotic multiplicity of activity.

By the beginning of the second week everyone in the City felt the power of creating their environment. The time had come to name the city, elect a government, and get the green money circle

Illustration 41**Barnett Shoals Elementary School****Athens, Georgia 1990****City life**

The Bank faced onto the Town Square which was the center of community life. Here the teller, inside the Bank, and a customer is seen making a deposit at the bank. Town meetings, Court, and everyday business affairs took place in the Town Square. With the addition of 240 square feet of upstairs office space, which held half the desks, enough open space was left for the entire class to assemble on the floor. This open floor space created an expansive feel to the City, disproportionate to the actual square footage. The lower photo shows the layout and cutting of the triangular bank teller's windows in a canvas wall. This was later enlarged to allow more light into the bank. The canvas walls gave the entire City a bright, soft, quiet atmosphere.



operating. Monday, Dolly wrote the list of possible names on the board. Slips of paper were passed out, speeches given in favor of particular names. Dollywood was vetoed by Federal decree; anticipation was in the air. The votes came in, some not so secret. Lawrence counted the votes and announced the winner, Mini-City.

The occupants of the Bank, Police and Law Office moved into the existing loft making some room for the construction of building number two. Construction began on the Restaurant, the building farthest from the door. The wood was delivered to the hall outside the city. Everything outside the door was referred to as in the adjoining town. Each building was built by the people in that building during lunch hour, while the rest of class was outside on the playground, or at a special class (Art, P.E., Library, or Music). The 4" x 4" uprights were laid down; then the floor joists with knee braces and handrail were lag screwed on them. When two sides were complete they were held in position and fastened together with all the connecting joists. This required extensive measuring and learning fractions of an inch, "One of those little marks next to the long one between the 6 and the 7". Lengths were often attempted in centimeters; the dual measurement systems taught and lodged in the minds of these children taxed their minds as they struggled to get the sides to match. After a demonstration of safe sawing, drilling, and use of the socket wrench, everyone had an opportunity to perform all the operations of construction. The use of an adjustable square and level was attempted by all. Next came the floor boards, two 4' x 8' pieces of 3/4" plywood, which were screwed down.

(Every part of the fourth City was screwed together to allow quieter construction and ease of dismantling). The ladder was built, the desk moved up and in, and within two days, the first building was set up. Ted, Joe, Amy, and B.J. did the majority of the sawing. Watching the dedication and persistence of these young children sawing and sawing for ten minutes on a 2" x 4" reaffirmed the researchers conclusions about attention span being related more to interest than age. Likewise the cooperation exhibited between the girls and boys, black and white, skilled and unskilled students grew with each stage. Because the rest of the class were waiting not too patiently for the tools, the exterior walls were added after everyone had built and occupied their buildings. The Shopping Center was next. Across the street from the Restaurant, it was easier to explain to the workers since a prototype was now in the room. Thursday found the Veterinary, Utility Company, General Store workers in their building. Friday, the Post Office/Hospital building next to the door was begun. During the third week, as everyone settled into their buildings and the tempo and enthusiasm rose, a town meeting was called for Wednesday to discuss problems which were coming up regarding codes of conduct in the new environment. Dolly asked the children to develop a list of behavior unacceptable in the buildings. Predictably they all knew what was appropriate; the problem was that self control was severely lacking. Dolly and Lawrence explained that the number of people sent to the hall, kept in from recess, and not allowed to participate in City activity would increase if everyone could not control themselves. Ted whined that Phyllis was bothering

him, and he wanted to move. Tina complained that she could not deal with Joseph in her building because "he made such a mess". Rico was cited by four folks as causing havoc by coming into buildings uninvited. Then six hands went up to register complains about uninvited guests, or "pests" as Jay put it. Sara wanted Joe and Bryan to stop stomping around upstairs, "It is giving me a migraine headache." Dolly and Lawrence looked at each other as the din of complaints rose, both remembered similar confusion and disorder in past cities. It was fitting to allow enough noise and resentment to build where the children would call for controls and rules. Better for the citizens to impose controls on each other than to constantly come in from outside and discipline them. Key components of the City Curriculum were brewing; intrinsic motivation and self-discipline together with peer pressure created an understanding of why laws come to pass. It was very loud by now, Dolly was concerned the teacher next door would come in and deliver a "Heads on your desk now!" sort of order.

Order was called, Lawrence reminded everyone that until order reigned no walls would be installed. Without the walls the adults could see everything going on; more than the two levels of desks, the addition of walls created the greatest need for the children to exercise self control. Closure was a top priority, the pleasure of privacy was etched in the children's image banks forming through out the City. The stage was set; the paint was in the corner, the sketches for the facades were refined and ready.

Many things began to happen at once. The routine of morning work on their school assignments followed by afternoon work on the City was smooth. Six children with discipline problems had been in the hall enough, three of them to the office that they had for the most part decided to accept the rules.

Many events took place on Wednesday. The campaigns began in earnest for mayor, judge, and city council. Each floor would send a representative to council. Kit and Sara ran for judge. The mayoral race was split between Ann, Jay, and Phyllis. The campaign chairmen developed slogans, and worked on speeches and platforms with their candidates. The time clock was delivered, time cards made up for everyone and the process explained and practiced. The design of money was complete with pictures voted on for the one, five, and ten dollar bills. The masters were then cut by the artist and the presses ran. The bank opened accounts for all those interested. Bookkeeping used both a computer and card files to keep balances. The store began collecting merchandise. The factory was opened by Lawrence, it was located by Dolly's desk under the Jail Annex. In that, the author owned all the tools and no children requested to be factory workers he set up production as piece work by the hour for anyone interested. There was good money to be made for an honest hour of hard work. This year it was decided a Marble Madness Maze would be manufactured and marketed. The initial group who asked to work were Bryan, Phyllis, Ann, Leigh, and Chris. Tina was added when her school work was handed in. She was not in the habit of completing her school assignments and

turning in her folder every day to have it checked. During the entire Fall the class was taught using decentralized and individualized assignments. Most students could pick up their folders, go back to their seats, complete the assignments in four subjects, and turn in the work at the end of the day. Thus when their desks were all spread out and the teacher could not "keep an eye on them" they were accustomed to motivating themselves, accustomed to working on their own, and accustomed to each working at their own pace. Self discipline was a most important factor in the implementation of the City Curriculum. Last but not least, that Wednesday was the day Michelle, the new kid from South Carolina arrived. Polite, shy, and cute, she was wide eyed as she took her seat upstairs in the Post Office building. Watching her look down on the Town Square the author, was impressed with the apparent transitional ease she showed. She promptly became the second page editor of the newspaper, opened a bank account, filled out a time card and started taking home tales of City life to her family. After two weeks, her Mother came after school to thank us, saying Michelle had never liked school until she entered "Mini-City".

In the book Learning and Teaching the Ways of Knowing (Eisner, 1985), seven different modes of knowing are described. The activity generated by the City Curriculum is a manifestation of six of these modes, four of which are very seldom elicited or reinforced in public education structures. Eisner writes of the aesthetic mode of knowing. He emphasized that the rewards emanating from concern for test results undermines the aesthetic. With a "focus on the short-term

and the instrumental" the satisfactions found in "the joy of the ride, not simply arriving at the destination" decreases the value of what is learned. By creating a City with all the attendant images and forms we allowed the class to cultivate the sensibilities. Attention to the aesthetic aspects of the subjects taught, Eisner writes, "...remind students that the ideas within subject areas, disciplines, and fields of study are human constructions, shaped by craft, employing technique, and mediated through some material." A basic criteria for how well the City is working is how moved the children are and how much satisfaction they are receiving. "The consummatory function of the aesthetic provides delights in the inquiry itself" wrote Eisner. By conveying the content of city living in the context of city living, this education can tell children about the world in ways specific to its nature. Second, the experiential rewards of making the City are provided by the operation. The aesthetic is not in the province of art alone, rather it is significant in all human formative activity. The students use aesthetic thinking not only while designing the images for the money, arranging the offices, and painting the buildings, but also while crafting a campaign, debating a sentence in court, and laying out the newspaper.

There can not be any knowledge or experience without the acquisition of the relevant concepts (Ellis, 1973). Efforts are made, in the City, to elicit and reinforce the acquisition of concepts in the aesthetic mode. In addition, in the City Curriculum, the children develop the use of a family of concepts of moral judgment and awareness dealing with "ought", "wrong", and "duty". There is an

objectivity to morals irreducible to other forms of knowledge. Likewise, clearly distinguished from these two is our awareness and understanding of our own and other people's minds. Essential to interpersonal experience are the concepts "intending", "believing", "deciding", "hoping", and "enjoying". The knowledge and use of this area is implicit in the success of the City, both now and when these children are adults. Philosophical understanding also involves unique second-order concepts and forms of objective tests irreducible to those in the above areas of knowledge.

Mapping the interaction, the interrelationship of all the concepts is the critical problem presented to the curriculum planner. The ecology of the individual at a harmonious productive level grows by integrating concepts from all domains. As presented by the City Curriculum, the division into subject areas of the total project is inappropriate. Weeks progressed, the City was built and became operational. Dolly, Lawrence, the student teacher Susie, and visiting adults made the effort to focus on as many avenues to knowing, as many concepts in different frameworks of reality as were appropriate for the day.

Following are a few general observations: There were many "at-risk" students within the City. There were so many below grade and above grade level learners, that the term "grade level" learners represented the minority. Whereas Jay showed excellent use of logical, mathematical, and scientific concepts, his interpersonal and intuitive skills were undeveloped. Phyllis showed an amazing command of personal skills yet could barely divide. The lack of

aesthetic judgment of Chris became evident as he scrawled in paint across the front of his building and yet philosophically he understood and entered into abstract conversations about the very essence of the project. Sara, always quick to begin a new project when obstacles arose, learned to work through her aesthetic differences with the other editors of the paper. The opportunities to target strengths and weaknesses of the individual children available in a project-centered curriculum are beyond the capacity of one teacher. Thus, this curriculum must be conceived of as not only project-centered and child-centered but also aesthetically-centered. The image development potential of a dynamic metaphorical environment which surrounds and invites creativity must be emphasized.

Linda's dad brought in a dozen washer boxes. Poised in the hall, they presented a potential energy only suggested by their life as shipping containers. The walls went up in the same order as the buildings. With painting, nailing, ladders, discussion, and laughter all converging on the skeleton frame City, the third week brought renewed magic to this third grade classroom. Other children in the school were now constantly coming by to check out the progress. Many asked when they would begin fixing up their rooms, "start doing the fun stuff Mrs. Davis' room got to do". J. P. was up on the ladder, painting window boxes under the windows. Leslie was running Chris out of her building when he backed into the ladder, knocking the can of yellow paint onto the carpet. Dolly, who every year had cleaned up a paint spill, was only mildly upset. She was

reminded of the year enamel paint had been donated and a full quart of red went down right in the middle of the town square. Wall-to-wall carpet in a room of active eight-and nine-year-olds is a tribute to manmade fibers plus a decision toward noise suppression and warmth. Making choices and decisions using all the available facts would characterize life in the City. Even though only one building was supposed to be painted at a time, Lawrence discovered three renegade painters in back of the Restaurant busily painting bricks. Risking punishment, they chose to hide and paint. How could an art teacher deal out a severe punishment? With the advent of walls, windows began to appear. Badge-shaped, cross-shaped, cloud-shaped, and lighting-bolt windows. Some were hinged to allow closing, others were cut too low to see out when seated inside; these were re-cut or enlarged. Much was learned about planning and execution of designs that week.

Week Four

The fourth week is always the transitional point from construction to operation of the City. Money was printed with the students' award winning graphics and every citizen received \$40.00 (these children were experienced Monopoly players). Check books were printed and accounts opened. Children began to work on City functions and Dolly or Lawrence used time cards to determine wages. Street signs were made and installed. Back Street, Main Street, Water Street, Short Street, Law Avenue and Broad Street became

Illustration 42
Barnett Shoals Elementary School
Athens, Georgia 1990
City life

The instructor seen in the upper photo moved her base of operations to any available clear surface. The normal assessment tests and third grade work were given to this class in addition to City work. This double work resulted in the children increasing their efficiency for their regular school work to free up time for optional City work. The many opportunities for self-directed, self-chosen work was appreciated by most children. In the four City years, no more than two children per year were unable to participate in most of the City experience.

With a ten-foot ceiling in the classroom; the "citizens" could build two story buildings with close to five foot ceilings. The tallest children learned to duck, as did the adults, while in the buildings. The top floor had great light and a view, while the downstairs was in the mainstream of the action. The top floors were the preferred office location for most children.



points of reference. Daily clean-up and general maintenance was rotated and paid for, as was work in the Toy factory for which workers could clock in and be paid. The Electric Company and Phone Company were public services, and time spent installing lines was recorded on the clock. Thus, many ways for money to move into and around the city began. Elections were held. Jay took the Mayor's job with a straight party ticket "boys against girls." Chris was elected Judge, promising favors the following weeks would reveal he could not deliver. Interestingly, the City Council spent several meetings and weeks educating their Mayor that this was not his government to do with as he choose. It was a "representative government" which somehow meant not even they were totally in charge. Of course, as in "real life" the people in charge were the ones who did things, irrespective of their job or position. Many issues were brought before the Town Council during the town meetings each week. Taxes were levied to generate working money to pay government employees. Laws were enacted to direct behavior on noise, aesthetics, movement and interaction.

Week Five - Typical activities in Mini-City

Monday morning; Dolly has written everyone's weekly assignments in their folders. They have assignments in many different books each related to their individual work progress. After a bit of visiting, they move into their buildings and begin today's assignments. Dolly has rented downstairs office space from the Post

Office on Law Avenue near the Town Square. There is a steady stream of questions brought to her. As 9:00 arrives, she calls the Red reading group down for a lesson in the Square. At 9:30 Susie, the student teacher, takes her math group into the hall for a lesson on graphs. During the morning, the Title II reading students leave class for an hour, as do the five Gifted and Talented (G&T) students. Monday morning work moves along independently until 11:00, the class lines up and leaves for music class before lunch. After lunch everyone who has completed their Monday work can work in the City. Ann and Leigh are writing an advertisement for the Marble Madness Maze which is in production. Ted and Julie are cutting out blocks which they give to Tina to sand. These are then carried over to the paint shop on Back Street to be finished in four colors by Amy. Sara is working with Michelle on the lead story for the first edition of the paper. Tammy and Margaret are in the hall filming a news cast. There are reports of a cookie thief in Mini-City which they are investigating. Tina and David are playing around in the Restaurant not doing their unfinished math work. J.P. goes in to join the fun only minutes before Dolly sends them all out to the hall to work. Will and Mike are upstairs in the Law Office moving their phone and electric switch after redecorating. Joe is going over his Bank account and check book with Bob, his most recent statement didn't agree with his balance. Lawrence and Rico are setting up a jig to hold the Maze blocks for drilling. Dolly is in her office going over spelling words with Phyllis. Focus, commitment, enthusiasm, skill development, and knowledge acquisition are manifested in the

classroom. The simultaneous/interdependent nature of jobs, disciplines, and subjects is experienced during life in Mini-City.

Week Six and Seven

There was never a doubt about two-thirds of the class going to fourth grade. The last third, the national average third which statistically would not finish high school, were showing their "At-Risk" signs already. The National tests come down hard on the third grade. Down from Iowa, those criterion reference folks sweep, helping double check if the "facts and skills" are being absorbed by the nations youth. The State allows students to be retained once every grade level. In the City, there where repeat repeaters; some eleven-year-olds towered over their classmates. There was no problem integrating these different ages into the project. Their superior strength was an asset to construction, their height a help in all the work above six feet. One of the strengths of a project-oriented instructional method is the merger of various ways of learning and knowing. Those children who had failed entire grade levels, could, while working in the Toy Factory, find success, build confidence, and gain statue with their classmates. They could be equals in the town meetings, building the buildings and publishing the newspaper. The opportunities to fail were not omnipresent as they had been in past years. The ability to memorize was not as consequenstial. The purpose of schooling is to help children create meaning, to help them learn those lessons which they are on this

Illustration 43
Barnett Shoals Elementary School
Athens, Georgia 1980
Super City

This view is of two boys working together to cut wood for their building. It is a typical day in the construction of the City. With all the citizens having assignments to complete, they carried their work around in folders, foreshadowing the briefcases of future years. The laughter and excitement of the city life was directly proportional to the social climate allowed by the adults. Both Dewey (1915) and Wigginton (1986) refer to this social environment being essential to the growth of the children. A bit of sawdust on the carpet, the chance of hitting one's thumb with a hammer, and some noise are acceptable inconveniences when a serious socio-drama of City construction is in progress.



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earth to learn. When a school system loses sight of the lessons of love, by focusing on arithmetic ditto sheets, that system should not be surprised when students quit.

The interpretive aspect of criticism seeks to determine the situations meaning to those involved. The values of a system are manifest in the environments it builds for the children. The conceptual maps the students are creating account for their behavior. The process of education which fosters personal development is important to observe; in predicting some of the consequences of the City. The opportunity for success, the chance to do what is loved, and the value of creating an environment to play in, all contribute to social well-being. These are the values that are so often rejected when the descriptive terms schooling, socialization and learning are used to design educational facilities. The traditional lines (groupings, test, endless ditto sheets and workbooks) all convey what our society deems important. Besides the 33% who quit perhaps another 33% don't like the process. These are the qualities of schools transformed into quantitative terms.

The seventh week found less absentism. It found more "folder work" finished on time. More laughter, cooperation, self-discipline and self-confidence, and less fights spread throughout the class. New ideas, elaboration on themes, greater diversity, pride, and a depth of understanding about city living was shown. There was a spirit of unique ownership about this place called Mini-City, the fact that it was at school brought a new sense of what school really meant. The enthusiasm of creating a television show, of being a decision-maker

on policy, a problem-solver, of being a paid worker was felt by the children. The value of the arts in informing the world about what one feels and knows distinguishes the City method from the two-dimensional textbook method of instruction.

Objectively, the students, their parents, and this researcher believe the City Curriculum works in achieving the aims of education. "What so-called objectivity means," Eisner writes, "is that we believe in what we believe and that others share our beliefs as well. This process is called consensual validation."

Week Eight

Phyllis and Linda were on probation for fighting on the bus. Mark was suspended for stealing a Video tape from the Library. Chris had a broken arm from soccer. Ted was found with a knife. The Restaurant workers continued to fool around in their building, never finishing their folder work, thus seldom participating in City work. The system broke down at this point. It appears those students who need alternative modes of learning, those who could benefit most from City life are not allowed to play. Making room for parallel methods of instruction is one of the obstacles to the full implementation of new curricula. The tests are aligned to the existing order; success is judged by the status quo. Dolly felt powerful pressure to instruct the class on the prescribed third grade content. It is similar to getting a Bank loan to build a home with solar heat where the Bank requires 100% conventional heat systems

to be installed. Most people cannot afford both systems. Conventional systems get the loans. In the implementation of alternative educational systems, the state still requires 100% fulfillment of existing norms. Most teachers and students can't give more than 100%, so research into alternatives is rare. The remarkable ability of Dolly during all the cities constructed was, although she felt pressure to follow the district goals for her class, she brought other goals to her classroom.

Week Nine and Ten

Mini-City is to come down. Deconstructionist theory was made manifest. What do the children learn from dismantling their offices, taking down the street signs, making the Town Square just another place to put desks? The loss of 200 square feet, which the second floors added, was missed by everyone. The room felt more crowded because you could see everyone all the time, there was no privacy. It was louder without the cardboard walls. The vantage points became one dimensional, one plane of activity. The open space was gone, "It is so crowded with all these desks in here." The unique character of the room was gone, "Now our room looks like everyone else's." The systems which the City brought were gone, "Is this money worth anything anymore?" However, those images, captured in photos and the memories of the citizens would remain forever. "I was the mayor of Mini-City." Kim, a citizen of Super City in 1980, recalled ten years later the cardboard steps which kept breaking

with all the visitors. Tim recalled the Welcome Center he operated outside the room. Memories of playing with the phones, pulleys and lights, sawing and hammering at school came back to former City participants during their interviews.

This investigator observed the flow between subject and object, the line between content and context fluid in the children's experience of the City. Their experience showed objectivity is a function of intersubjective agreement among a community of believers. The set of ideas made useful to the community of builders allows them to work more effectively. It enables them to perceive city life in a more complex and subtle way. The experience expanded their intelligence in solving important problems.

The wood was carried out and hauled off to store for the next City. Complete with scrawled messages, paint markings and holes it carried a presence from its' former life. Some students were retained in third grade. All went back to a teacher structured curriculum in which art is a once a week subject.

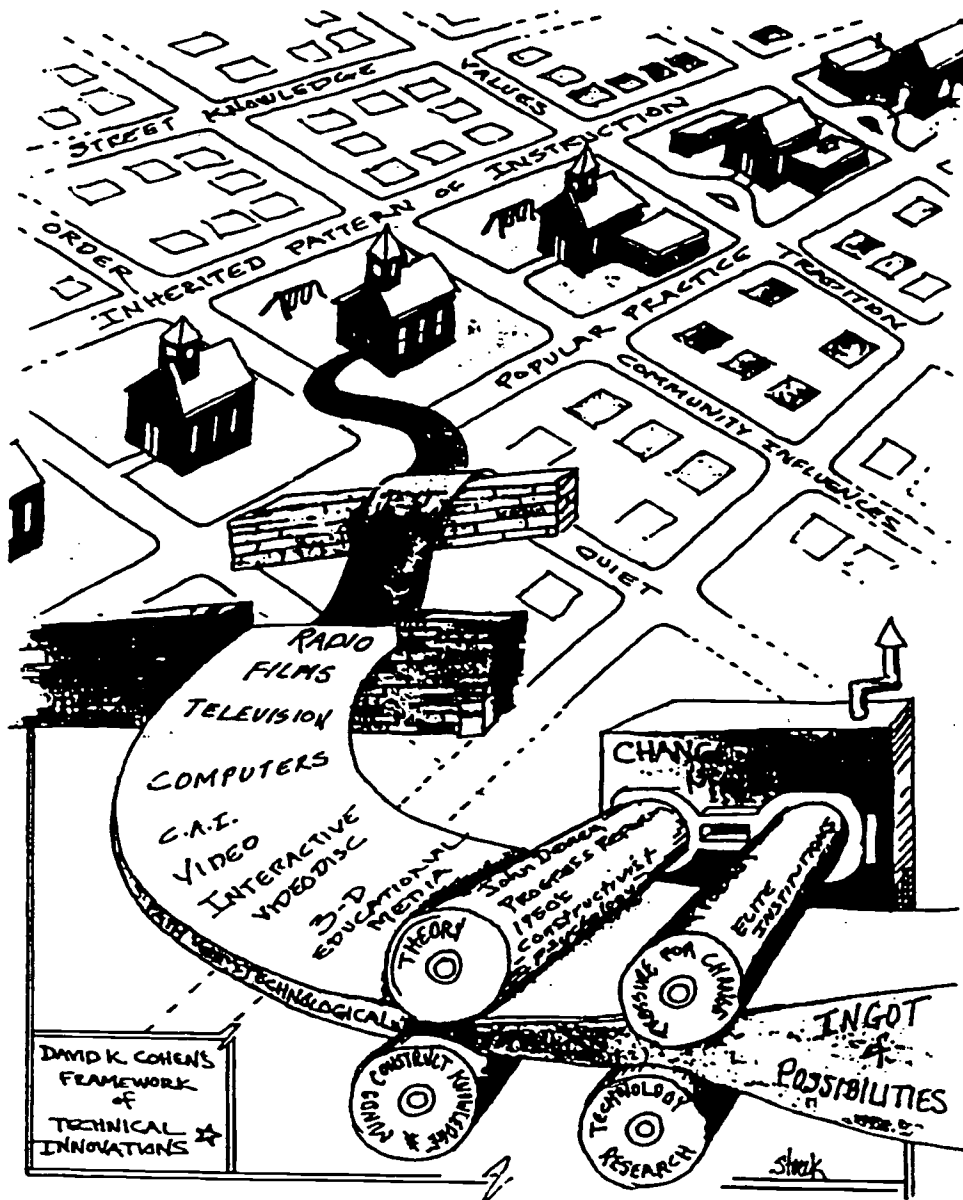
Description, explanation, and prediction are made possible by scientific inquiry (Eisner, 1985). It is beyond the scope of this research to predict the specific effect of their City days on the lives of these children. The general effect, however, was summed up by Leslie who asked, "Do we get to build a City next year?" The power of the structure to elicit creative responses, such as inventing solutions on ways to make an elevator to the Law offices was shown often. Transference of lessons from school assignments to real life situations, an aim of educators, was found to be prevalent among City

students. The superintendent came by one year for a visit; he was pleased with the children's excitement. The general consensus in the district was this was Dolly Davis' unique project; no one else could do it.

The conclusions reached from implementing the play environments and learning environments will be brought together in a set of design criteria for educational facilities in the next chapter. It was found in all these projects that implementation required more than money, labor, or materials; foremost, it required permission.

Illustration 44
Technical Innovations
Lawrence Stueck 1988

Illustration of the chain of events which gave us our present reality. Believed by many to have always been, this shows how recently the shape of our educational facilities took place. The understanding that textbooks are a relatively recent addition to teaching environments and can certainly be replaced was most instructive to this researcher. When the context begins to be seen as common sense or the present system is preferred despite valid reasons for changing it, there must often be a catastrophe like illiterate graduates to force change. The environmental situation worldwide as well as the economic situation worldwide both fueled by the population explosion on earth demand a change in the way we operate as a species. The way we operate is directly influenced by the way we educate and thus the change rolling mill must generate new innovations.



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CHAPTER SIX

Conclusions and Implications for Educational Facilities Design

Conclusions

The social climate of the child which Dewey refers to in his Educational Creed of 1897 (see Appendix 1) is similar to the climate during the post-industrial electronic age of 1991. The Foxfire method, developed by Wigginton during the past twenty-five years is similar to Dewey's method. This researcher found learning environments which encourage conviviality and foster a social climate of joy, also generate self directed learning. This learning can be directed as in the City Curriculum toward moral and cognitive development, along the lines of the school curriculum. It was found possible to integrate abstract lessons with the concrete structures as in Naturescapes, the Map, Spacestation, and the Urban Tree House. The active participation of the students in building the environment as in Earthworks, the Oglethorpe play environment, and the City Classroom, allows the individual to integrate with the social consciousness of the group.

The opportunity to impact a community greater than the classroom is seen in all the learning environments. It was found the students were self-motivated to create and operate the City Classroom and of course self-motivated to play in all the other environments. Practical arts skills, higher-order thinking skills, and

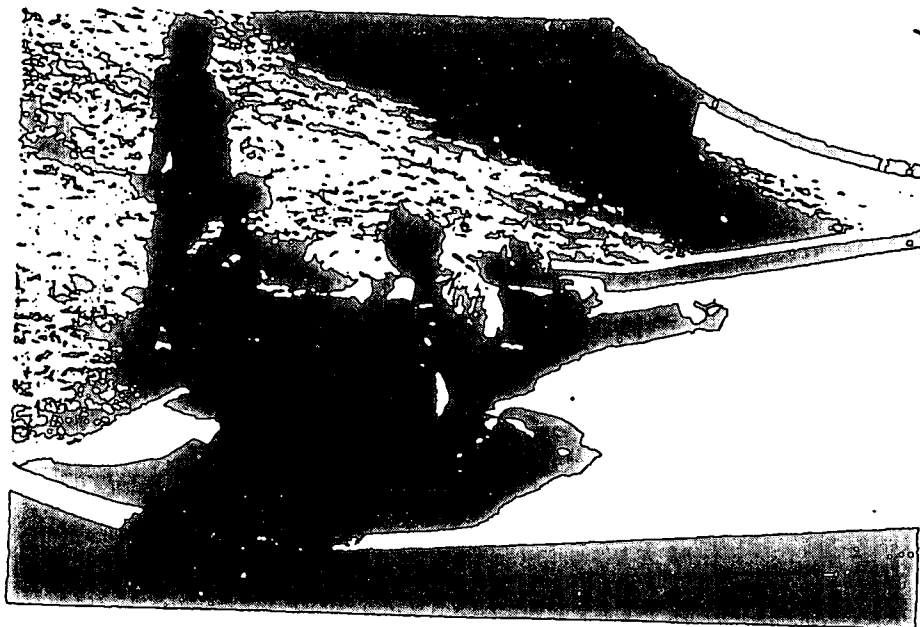
social interaction skills were observed in all of these experiments. Students of all ability levels were able to comprehend and actively pursue City work. The messages inherent in the context about town layout, job diversity, government, money exchange, taxes, utilities etc. were acted on by absorbed by the entire class. The role playing of jobs was adopted and then followed by 90% of the children. The level of abstraction required in one hundred days of City role-playing was observed to be evolving as the children caught on to the program.

The structural criteria of integrating the lessons with both the psychological nature of the child and the social nature of the group makes the context become visible. Educational technology, be it the building, the book, the video, the spoken word, or the Spacestation will transmit information in very different ways. How well the individual student will receive that information is the concern of the school system. Awareness of the context is understood when curriculum designers and teachers perceive the context as content filled. When they don't perceive the context as important, many messages will be presented unconsciously. When consideration is made for the context in which the information is transmitted, a more convivial atmosphere can be generated in schools. The present state of awareness of how critical the environment is to our survival on this planet necessitates our vested interest in the schools inherent lessons.

The six children seen in Illustration 47 are both allowed to behave as they are by the structure and directed to behave as they do by

Illustration 45
Wilson Mill Park
Atlanta, Georgia 1982
Slide Detail

This 15' x 8' slide allows multiple player options while going down and up. Fifteen feet of slide gives the opportunity for group dance slides, an interpersonal experience. An effort was always made in designing these play environments to not create situations for singular play or those waiting-in-line-for-a-turn situations so typical of older designs. These photos reveal that in sliding, as in all play, the process is more important than the end results. The use of a barrel vault allows the walls to become the floor and ceiling. The flat steel angled plane of the slide plays visually against the wooden arch in a dramatic pattern. Other visual elements in this environment include warped floors and walls, spiral stairs and arched bridges. The shape and form of environments elicit particular behaviors and ways of knowing. Knowing our behavior is dictated by the technologies and environments we use, tailoring the school context to the school content is a logical next step in the evolution of educational facilities.



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themselves. The combination of self-direction and dynamic environments generates a fertile ground for development. These children can roll slide because the slide is eight feet wide. When a school has gardens, children can plant flowers. The researcher found the possibilities are extensive when children are allowed freedom to experiment. When they are given tools and materials and time to create; their creative abilities flourish.

The restrictions placed on children by the present facilities and curricula play a role in creating poor attitudes. There are golden opportunities missed by ignoring the social reality of the child and opportunities missed by ignoring the psychological nature of the child (Dewey, 1915). In addition there are negative messages being conveyed to the children by the facilities built to educate them; messages of conformity, short-term gain, rigidity, and of those reflecting an aesthetics of efficiency versus beauty are pervasive (Eisner, 1985).

In the researcher's general survey of the trends in playground design, school facilities design, and curriculum design during the last twenty years the range of experiments he has witnessed have been remarkably conservative. With consolidation of school districts and the resulting expansion of administrations, control of diversity has regrettably become the common denominator. Because of the perceived relationship which play and manual labor have to the less prestigious human behaviors, the school curriculums have gravitated toward order and verbal/mathematical and logical activities. Little energy or support has been given to educational technologies which

encourage knowledge in the full range of knowing presented. It is believed that this unbalanced approach to education has been the root cause of education's problems (Eisner, 1985). Unless children are allowed and encouraged to create meaning, to experiment, to create, to play, and develop as their social and psychological nature directs them an imbalance will result. Attempts to redress this imbalance generated the many experiments in learning environments presented in this text. These experiments have been part of the exceptions to the general conservative trend in American education. Similar experiments around the country to make education more dynamic have been made by persons such as Eliot Wigginton (1986), Jay Beckwith (1974), Robin Moore (1975), and Anne Taylor (1975).

The following years may see major innovations along the lines suggested here. The increase of social problems will necessitate more experiments like the Ted Sizer's Coalition of Essential Schools (1990). The good work of Dewey and Wigginton will be further disseminated and hopefully lead to a total reappraisal of why we have schools. The findings of this research will hopefully encourage others to experiment with alternative environments to elicit and reinforce epistemic behavior.

In the following sections, the researcher will present a three-pronged approach. First a method of evaluating learning environments will be proposed. Second, five principles of design which help direct a balanced approach to this problem will be set forth. And third, the researcher will present a proposal of an alternative school facility which uses similar dollar and enrollment

numbers to an actual typical school which was presented in Illustrations 7-10.

Development of the Stueck Evaluation Matrix

The last nineteen years have seen many changes on the educational scene which have influenced the design of learning environments. The educational facilities and curricula which guide those facilities are directed by the climate of the culture. America's economic and moral position in the world was the foundation for the changes seen in the structures built. In 1972, the structures were built on the momentum of the Great Society and Open Education temperaments of the 1960's. By 1990, the structures began to reflect the fears of rising crime, rising energy cost, lowering expectations, a shrinking world economic strength, and a huge national deficit. The structures closed down, the windows shrank, the conservative tide of the Reagan/Bush years drove school boards toward a conservatism not seen since World War II. Administrations, State and Federal Agencies, along with local school boards, moved in the direction of deciding what students and teachers should do. Autonomy and creativity in the schools lost the gains of the 1960's and 1970's. Creative adventures in school structures and curriculum's were limited by this reactionary, back-to-basic trend.

The evolution of this researcher's environments between 1972 and 1991 have followed the direction begun in 1972 of individuals'

designing and building their own learning environments. The teacher is there to facilitate the learners' use of the environment. The teacher's attitude should be one of "What can I add to what the child does which will engage him more and more effectively in the world in which the rest of us live?" The learner and teacher jointly manipulate the environment to achieve the curriculum goals. These goals are generated by the students, the teacher and the community. The range of materials, design, location, and purpose is limited only by the imagination of the participants.

The Harvard psychologist, Dr. Howard Gardner in his book Frames of Mind (1983), writes of the seven kinds of intelligences mentioned also by Eisner & Vallance (1974). This researcher found the three-dimensional learning environments presented in Chapters Four and Five address the two main kinds of intelligences taught and tested in schools, the linguistic and logical-mathematical. In addition, the environments experiment with new means of teaching Gardner's spatial-artistic, bodily-kinesthetic, and interpersonal kinds of intelligence (Gardner, 1983). This broadened definition of intelligence is addressed by the City Classroom. This question of defining intelligence should be at the heart of how schools are organized and operate. One's definition of intelligence ultimately determines curriculum, teaching practices, school goals, and how we measure success.

The educational models of Gardner (1983), Eisner (1985), Illich (1976), Wigginton (1986), Dewey (1940), and this author are similar. Several of these authors' principles are similar to those employed

with the City Curriculum, the student built lofts, and the Map. These principles include active engagement in learning, students as workers-teachers and as coaches, integrated studies, emphasis on the process of learning, and a requirement for students to demonstrate or exhibit what they've come to know.

As was documented in Chapters Three, Four, and Five, the shape, purpose, and designers of the environments presented has varied extensively. These aspects can be developed into a matrix. This matrix encompasses the many factors which influence learning environments and which allow consumers and designers an overview of their educational world. One can plot physical, emotional, social, and psychological factors on the matrix. This multi-dimensional plotting then generates an overall image of the educational reality. Many paradigms of evaluation in education focus just on particular aspects, for instance the cognitive retention of specific facts by the children, often discounting the total effect of the schooling on the child. The sad fact is that, by systems discounting the total effects of the schooling on the children, regrettably often children will drop out of school. The matrix this researcher is instead recommending is an effort to consolidate assessment skills in all domains of knowledge and life, in order to arrive at a comprehensive overview of school facilities design.

In the Stueck Evaluation Matrix ,the axis continuum of Environment includes the buildings (and grounds), the educator perceived learning resources (books, tapes, pictures, models, instructional materials, etc.), and the play spaces. Illustration 44 by

the author shows the evolution of technical innovations in education since 1820; it exposes many factors in school change. An easy way to visualize the environment axis is to consider it to be the context. There exists a wealth of instructional resources within the 3-D field of educational facilities. The lunchroom is a fine example of an under-utilized learning environment. The differentiation of what teaches and what doesn't, plus our erroneous belief that the child's reality is similar to the adults, are root causes for the limited vision we find in our educational system today. Eisner writing on the school architecture of today says,

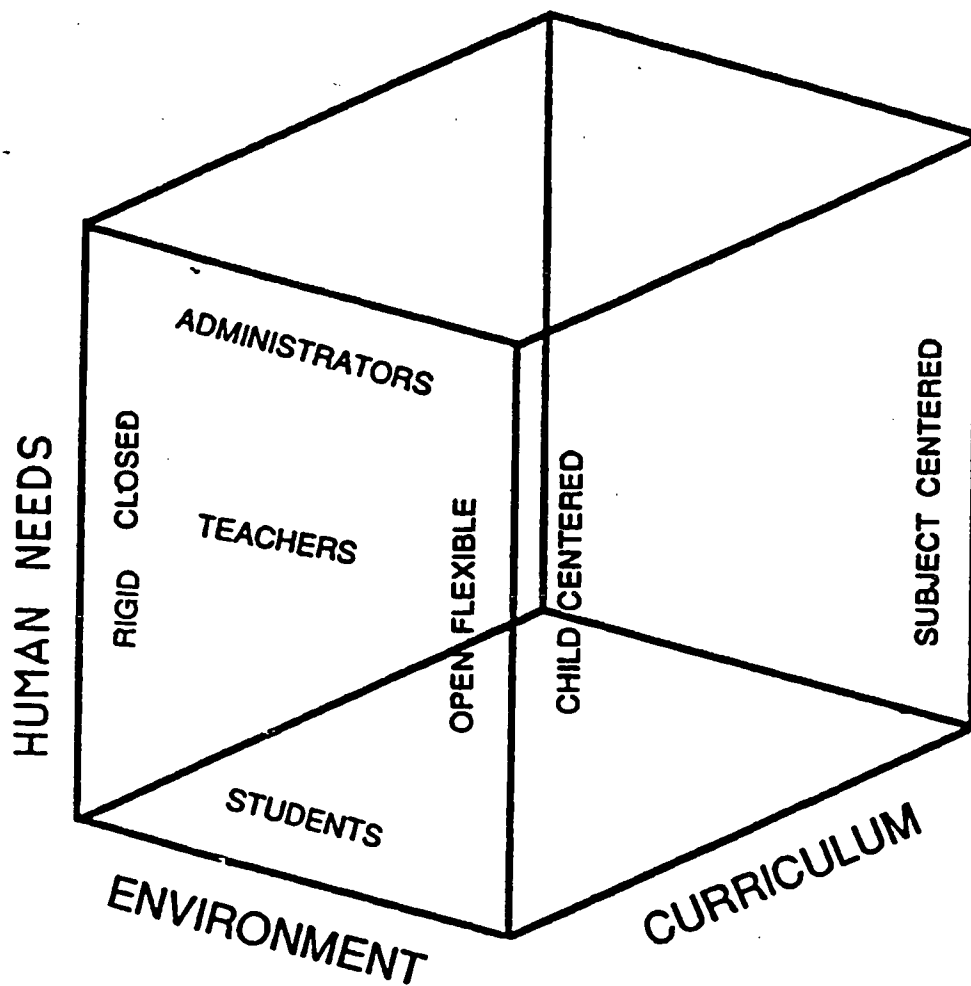
. . . most school buildings, particularly those in cities, are characterized by long vacant halls with nests of well-insulated rooms opening onto them. The rooms are usually identical: strong, rectangular boxed, drab in color and not given to amenities. The rooms speak of functionality but do not address themselves to the aesthetic needs of either students or teachers. They are not places in which one would choose to spend a lot of time (Eisner, 1985, p. 223).

This researcher agrees with Eisner's assessment of the drabness of most schools. How could this have happened? Where did the existing vision come from and what were its goals? The evaluation matrix is used to graphically represent the relationship of the elements of school culture. Each element is plotted along the three axes creating a three-dimensional scatter plot. The analysis of the balance and philosophical leaning of the system is thus easily visualized. Adjustments of design elements along the three axes can

Illustration 46
Stueck Design Matrix
1991

This matrix allows the user to generate a three dimensional graphic illustration of an educational facility. All facets of the school are plotted on the matrix, to create a scattergraph. Each aspect is located along the three continuums by up to three different researchers. Admittedly judgements of where individual elements fall on these continuums will vary. The matrix is not designed to assign specific numerical points to the schools elements, rather it is to generate a field image of the balance and bias of the system studied.

The author has plotted aspects from the suburban school design presented in this chapter. Having plotted points over a wide range of the total field indicates consideration has been given to the full range of each continuum on the Matrix. When a system is plotted and the data falls in a narrow section of the Matrix it indicates an imbalance, and a strong potential for problems.



STUECK EVALUATION MATRIX

then be made to achieve overall balance. Illustration 46 shows the entire matrix with notes on the three axes. Illustration 47 plots for comparison the Whit Davis school on one matrix and the proposed Suburban School on another matrix. The students, teachers, staff, administration, parents, school board, and community are all located on the Needs axis of the Matrix. All of their long-term and short-term needs can be plotted along the continuum. Needs and perceptions vary within vantage points. When a child passes a test we perceive her/him as learning the lesson in the curriculum; we perceive ourselves as good teachers. When the student is failing and not "learning" the lesson in the curriculum other possible perceptions such as disabled learner arise. We might ask, "Is a teacher teaching if no one is learning?" By focusing on different aspects of people, our perceptions and our actions will differ or expand. This evaluation matrix is proposed as a tool to be used in the design of new educational facilities and the renovation of existing facilities.

Educational facilities design is hopefully driven by educational goals. In education, the goals are dictated by our evaluation criteria. The instructional method is likewise directed by the evaluation criteria to be used. Thus an evaluation matrix can be an indicator of a design matrix, and, vice versa, design can indicate evaluation.

All of the elements chosen and incorporated into the curriculum are plotted along the Curriculum continuum. These elements include the null curriculum which are those items left out of the school. The hidden curriculum encompasses the context of the course of study and includes the content chosen, the arrangement of that content,

and the means of conveying that content message. This also includes the way time is allocated and the ratio of staff to pupils two dimensions which teach the children our attitudes and values.

We cannot measure bricks or kilowatts in the same numbers as happiness and ethics. Correlation of measurements made using different scales and systems is difficult. To assess physical, psychological, spiritual, and social elements and then unify them into a matrix has technical flaws. There are aspects of the school day which are real and not measurable, in fact, there are aspects which are ineffable. The Stueck Evaluation Matrix will be used to represent with a scatter field plot the focus and bias of the curricula in two schools; 1) a traditional contemporary school and 2) the innovative model sketched out by the researcher. The objective of the evaluation matrix is to generate graphically an image of the total educational realm to allow an assessment of it's impact on the children.

When dozens of aspects are plotted on the matrix, areas begin to congregate and expose the bias of the particular school system. For instance if the system is biased toward energy efficiency the scatter plots will fall on that end of the environment continuum. If the system leans toward freedom of expression for the students and teachers, the needs continuum will reflect this preference.

What the matrix attempts to represent graphically is as many aspects as conceivable, and to represent these aspects simultaneously and in relation to each other. Accuracy is very important with evaluation scales and assessment tools. This accuracy and focus

precludes an understanding of the individual parts to the entire system. Thus what is lost in accuracy on the Stueck Evaluation Matrix will be compensated for by the overview of the entire learning facility which is generated. The next section presents five principles used by the author during the twenty year course of this research.

Principles in the design of learning environments

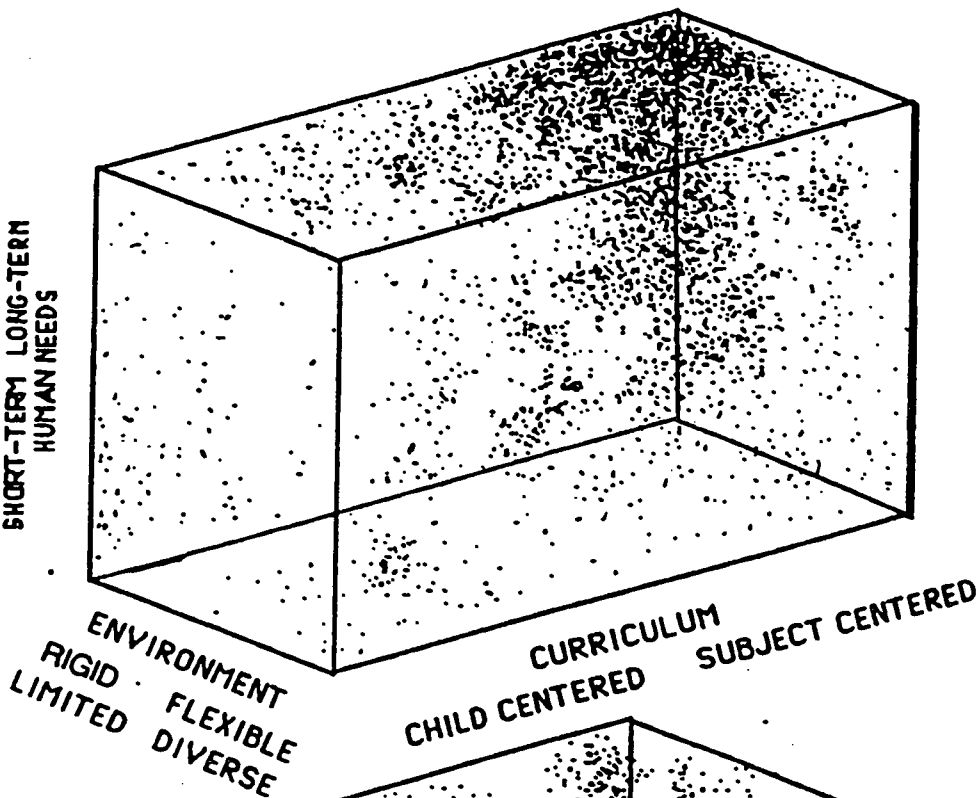
- 1) There are messages built into all structures. The bricks are not neutral; the shape and location of all the elements direct the participant's behaviors. The definition of structures includes all conceivable elements of the physical environment. Heat, information, energy, color, light, sound, and air quality all influence behavior.
- 2) Perception depends on one's vantage point. These could also be seen as various advantage points in the educational sphere. Unfortunately, the system tends to hold the advantage and the players scramble to keep up. This research has revealed participant disadvantage, is a result of the scale of educational systems. If an individual teacher or student is given autonomy in deciding what and how to learn or teach they generate a vested interest and motivation in the results. This self-directed vantage point leads perception in a creative and empowering direction.

- 3) There is an optimum human scale for all institutions. This scale, 150-250 people, tends to be much smaller than we see in our education systems today (Sale, 1980). This seeming small scale allows the individuals both social and emotional space to flourish. This scale allows a greater number of leadership positions to be filled. It allows a sense of community to develop which can then hold the participant's interest and enthusiasm.
- 4) Perceptions are led by preconceptions. This principle relates both Gardner's (1983) and Eisner & Vallance's (1974) seven ways of knowing and learning. We have all seen this principle in practice when the architects add air conditioning and brick up the windows in the elementary schools. Examples abound where the goals of school systems focus on a small aspect of child development. In fact, when child development is disassociated from human development is a classic example of a preconception leading perception. When the educators removed the child's principal learning behavior of play from the school day of the six-year-old, school becomes out of balance. We can only perceive what we have conceived of, thus the mind tells the eye what to see.
- 5) We learn what we are exposed to. As creators of educational facilities those elements we choose not to include by their absence are teaching the students what we do not value those elements. If our objective is for the students to learn about and to value beauty, the place where they learn must be beautiful. If

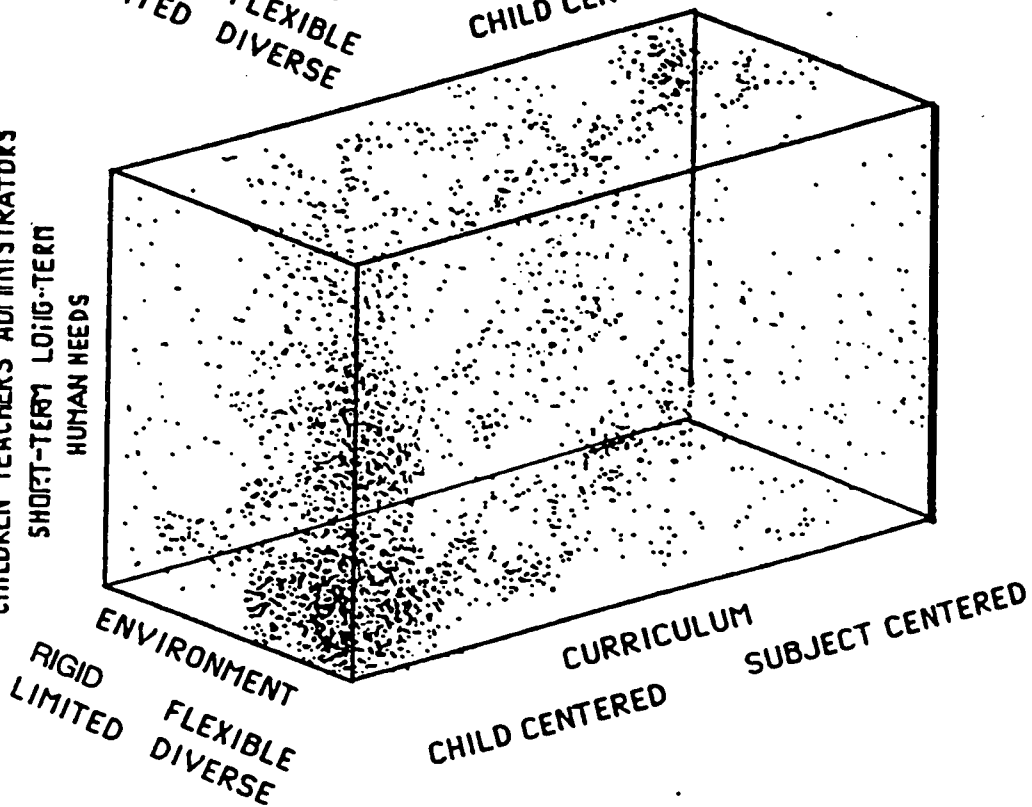
Illustration 47**Comparison of two schools on the Stueck Evaluation Matrix**

The difference in the pattern on these two plots is quickly seen. By plotting as many possible points of data on the Matrix an evaluation can be formulated as to the direction the system is taking. Judgements can then be made as to how the environment matches the stated objectives. Problems which show up in a system can be traced back to the structure using the matrix data.

CHILDREN TEACHERS ADMINISTRATORS
SHORT-TERM LONG-TERM
HUMAN NEEDS



CHILDREN TEACHERS ADMINISTRATORS
SHORT-TERM LONG-TERM
HUMAN NEEDS



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an objective is freedom of movement, the physical structure and the time structure must allow for and encourage freedom of movement.

Thus the five principles focus on environments, perception, scale, conceptions, and diversity. The next section will show the application of these principles in a visionary design called the Suburban School.

Implications for the design of educational facilities

As Dewey wrote in 1897, the state of the world requires a change. The Schools, i.e., the educational institutions are the only places this change can occur on the scale required. The graded-age stratification thinking pattern coupled with the "school as preparation for life" thinking pattern tend to be detrimental to any fundamental change in education. Like Dewey, Wigginton, and others, this researcher concludes the spirit of the children together with the social climate of their world are the entrance to human development. The root causes of the problems seen in education today as in 1897 are a blatant disregard for this fact. In creating structures for play and teaching these truths must be observed. The trend toward consolidation disregards the human scale. The trend toward national testing disregards many modes of learning and knowing. The trend away from field trips, construction, play, and art is a limited, financially shortsighted trend. Edward de Bono (1982) in his thinking course

Illustration 48**Photo's from Dewey's 1915 book****Schools of To-morrow**

These three photos were taken of innovative schools which the Deweys found around America. They believed dramatic changes were taking place in education, in a movement toward a child centered and project curriculum. This same hope was voiced by Robin Moore sixty years later. The author still believes these changes will come to American education. They will not be universal, the public school system will soon branch into many alternatives.

Discovering these photos after the research presented here confirmed the researcher's findings, it is not a lack of knowledge of alternative curriculums rather a distrust of them, which maintains the present system. The Earthworks (Illustration 29) is exactly like the Gully textbook shown here. The City Classroom is like the store and workshop shown here.



Children are interested in the things they need to know about. (Gary, Ind.)



- (1) An hour a day spent in the "Gym."
- (2) The Gully is a favorite textbook.
(Fairhope, Ala.)



Real work in a real shop begins in the fifth grade. (Gary, Ind.)

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writes about the implications of limited vision in our thinking. His discourse on thinking is designed to generate divergent thought. Solutions to the situation in education today require what de Bono refers to as "lateral thinking". "Lateral thinking" is a method for cutting across patterns instead of just moving up and down them. School facilities design, as shown in Chapter 2, has moved up and down one pattern of thinking. Buildings have been based on historical criteria, and resolving specific aspects such as heat, light, safety, and plumbing. Torrance (1979) and de Bono believe the schools must prepare the students for the unknown. They believe education should be about learning to think. "It is only our lack of complete information that makes it necessary for us to think" (de Bono, 1982, p.71). All plans, actions, decisions, and choices are going to be worked out using thinking and will take place in the future. Presently, too often education tends to be about the past. It is a matter of sorting, describing, reviewing and absorbing existing knowledge. The schools should teach the operacy skills of doing, application of experience to the current situation (de Bono, 1982). Play is concerned with the development of the capacity to deal with change. Art and construction are concerned with the generation of images which are new, (see Illustration 48). Thus, for this author, play and art are critical elements of an education which prepares children for the future.

The implication of using the findings of this study require a rethink of schooling as radical as Illich's deschooling. This is also as radical as the schools Dewey wrote about in 1915. The top right

photo in Illustration 48 is of Mrs. Johnson's model school in Fairhope, Alabama. It is based on Rousseau's central idea that the best preparation for adulthood is for the children to experience in childhood what has meaning to them as children. Sixty years later this researcher found exactly what Mrs. Johnson and John Dewey found, that the conventional school of today "is arranged to make things easy for the teacher who wishes quick and tangible results; it disregards the full development of the pupils" (Dewey, 1915, p. 18). The store photo and the school shop photo are from Gary, Indiana and show active participation in manipulating the environment.

The physical structure, the division and the use of time, the means of evaluation, and the teacher's values are constricted by the majority of educational facilities. This constriction seemed to demand that a new way of designing educational facilities be presented. The researcher has done this in his design called the "Suburban School". This "Suburban School" is designed using the Stueck Evaluation Matrix and the five principles of school design. It looks more like a small village than a school. As seen in Illustration 49, the five principles of school design can be incorporated into the structure of the school facilities. By considering the entire school grounds and the entire community as a learning environment for the children, important additions can; be made for teaching in Eisner's seven ways of knowing. Designing a curriculum with which the children can interact 365 days a year and 14 hours a day, the division presently set between school and life will be eliminated.

Of particular importance in this design are the scale of the structures, the relationship of the parts, the diversity of forms, and the opportunities available to all the students. The five principles are woven into the bricks and flowers. Messages about land use, personal interaction, beauty, creativity, and flexibility are built into the facilities.

Given the fact that there are now five billion people on this planet, the schools themselves, as societies' means of educating children, must address the use of resources for a sustainable future. In a democratic society, the distribution of resources to all the citizens is an important criteria to consider in design. Individualization of each teacher's classroom is possible with the existing electronic network. Separation of each teacher's teaching facilities is possible with the building resources and support facilities available today. The advantage of this separation is greater opportunities in building shape, vantage points, accessible space for outdoor activities, and the human scale which results in clusters of thirty children. A goal of the proposed design is to expand opportunities for full day use of the spaces by the entire community. A range of architectural expression is afforded by the division of the total space into many buildings. The unique character of the teacher and class can be added to the individualized house and yard in this design.

Critics might counter that this design, a dynamic open environment, would open more opportunities to vandalism, extended maintenance, higher utilities, isolationism, and a loss of the institutional presence of the school. But, this will not be the case if

the "school site" is integrated into the neighborhood and its cultural life. Only when the building is set apart and abandoned most of the year is it a target for neglect. In that the heating and cooling of the new buildings will be 90% solar, utilities cost of such separated building will be less than that of the present monolithic structures. This proposed educational facility draws on the design principles that many of the schools the Dewey's wrote about and found in their 1915 survey on education. One such principle the Dewey's wrote about was the children maintaining and building the buildings, as in Interlaken School, Indiana (Dewey, 1915, p. 87). Another is that the students work in real gardens growing some of their own food (Dewey, 1915, p. 98). Using these methods, lessons on math concepts are integrated with practical life lessons. The following is a proposal for an elementary school physical plant giving specific details and features.

Based on the same number of students and dollars spent for the 1990 elementary schools in Clarke County, the author developed an alternative plan for the Whit Davis location (Illustration 7 & 9) to illustrate the five principles of school design established during this research. The typical division of students by grade during school hours was followed in this alternative plan. The usage of the facilities in the modified design is greatly expanded by age range, times of use, and variety of activity.

In the researcher's model, modifications to the curriculum design on the physical level change the possibilities available on other levels (Wigginton, 1986). A simple cable hook-up or VCR to an already

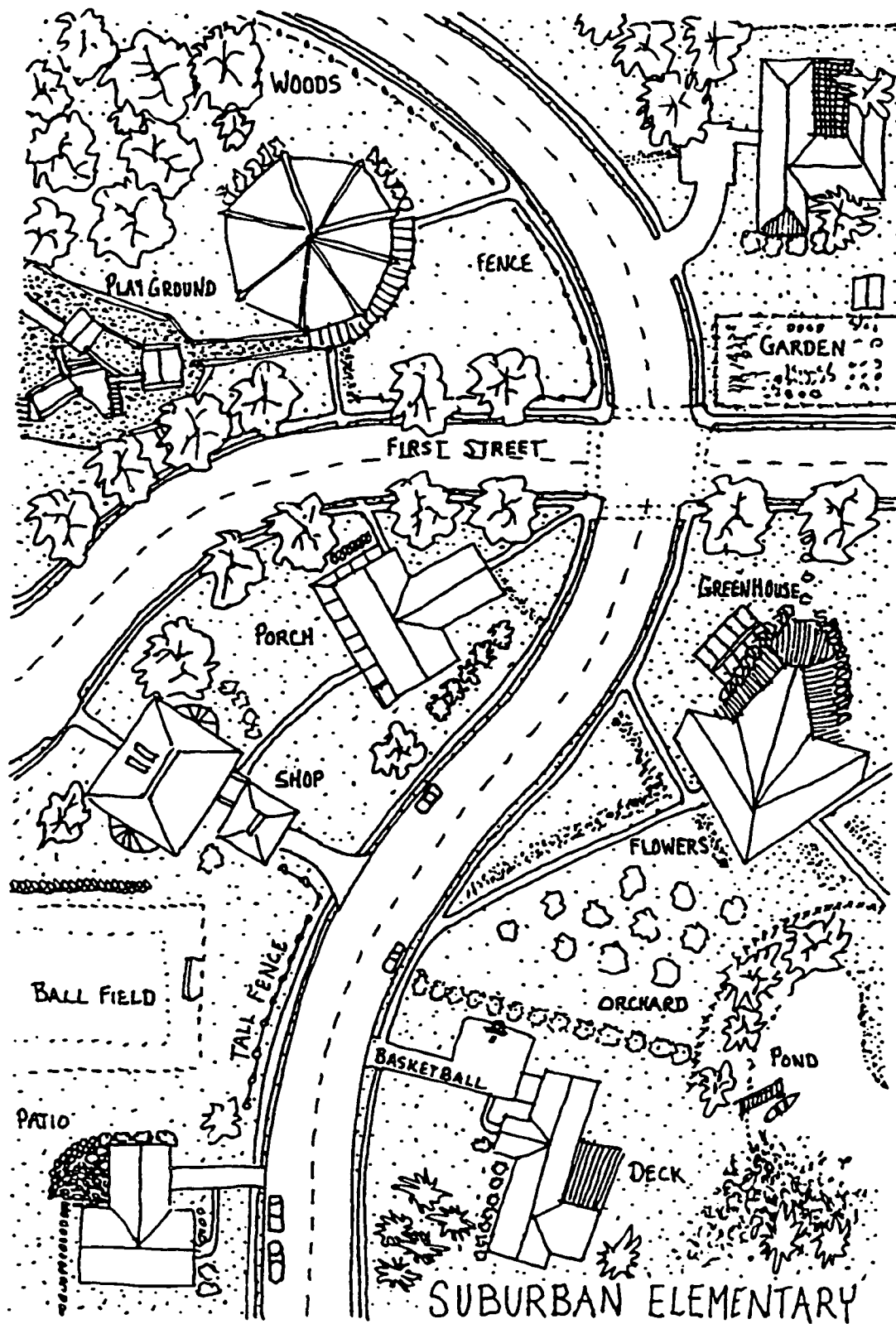
existing TV, expands the potential of this teaching tool. Examples of recent educational technology already put into practice in many schools of today are the addition of televisions, carpets, copy machines, and computers. When these were first introduced, they were all considered too expensive and not necessary by many school boards; today they are considered necessary. In designing a facility for use during the next fifty years, flexibility and expandability are critical design criteria. The many cost effective electronic links available today have been included in the proposed school design. These include phone and computer links between all buildings.

In this researcher's proposed model, the major difference seen on entering the school grounds is the scale and number of the buildings. Typically each 4000 sq./ft. house would hold a teacher, an aide, and thirty children. Within a school of 600 children this translates into 20 houses. There is also an administration house, a media center house, a gym, an auditorium, and a maintenance/security house, bringing the total to 25 buildings. Notable absences are the lunchroom, the tremendous system of halls, and the huge parking lots seen in a typical school. The closest parallel arrangement we have today to the proposed layout is the neighborhood subdivision with houses on one acre lots.

The advantage of deconstructing the monolithic school house is to provide flexibility, diversity, and excitement to the physical plant. The Whit Davis school classrooms seen in Illustration 7 have approximately 25 children, one teacher, one sink, two windows, one door, and one closet in 850 sq./ft.. By comparison the proposed

Illustration 49
Suburban School Design

Using the five design principles and the Stueck Evaluation Matrix the author developed this plan for an elementary school. With 25 buildings on 17 acres it is designed to hold 600 children. Each teacher has an aide and 30 children in their own house. The houses each have a yard, garden, driveway, deck, and porch. With 4,000 sq./ft. there is room for quiet places, offices, a meeting room, an art room, kitchen/science lab, garage for loud play, and plenty of storage. On the grounds there are a caretakers/security complex, a gym, an administration building, and a multi-media center. With 25 buildings the range of architectural styles, vantage points, and movement possibilities is extensive. All buildings are linked by computer, and phone lines. Lunch is prepared in each house by the class and the aide. The adults which work with special activities (except gym) move to the houses versus the class moving.



Suburban classroom has 30 children, one teacher, one aide, two bathrooms, one kitchen, a porch, a deck, a shop/art room, a reading room, four study rooms, a teachers office, a meeting room, and extensive storage, many windows, doors, and walls in 4000 sq./ft.. All of this is set on a one acre landscaped lot, with a driveway and parking for four cars.

The standard Classroom House of 4000 sq./ft. would cost \$150,000. The total school with 20 houses plus 5 other buildings of similar cost, totals \$3,700,000. Streets, utilities, and landscaping bring the total facility to \$4,000,000, the same as the Whit Davis School used as a comparison base. With this financial possibility established, consider the educational advantages of the proposed plan.

Each house could be of a unique architectural style exposing the students to the advantages of different aesthetics in buildings. Each house might develop a personality compatible with that of its teachers and students. This personal involvement with the environment can extend to the yard and gardens surrounding each house. The ability to move in and out of doors and the variety of spaces available to all the students is greatly expanded with the porches, decks, yards, kitchens, study rooms, and shops. The space to store projects, supplies, and equipment is expanded. There is opportunity to spread out, be alone or in small groups, make noise, experiment in the kitchen with the stove or in the shop with tools. Having a teacher and an aide in each house gives the flexibility of dividing the class for projects like cooking lunch and organizing

plays. With a decentralized administration, the support staff travel to the individual houses for their work; for example, the art teacher, music teacher, the counselor, the cook, and the maintenance personnel arrive at different times. Control is given back to the individual teacher who is connected to the supply building, the media center, and the central office by computer and phone.

A major goal of the proposed school is use of the facilities by the entire community during extended hours (Illich, 1976). This is possible due to the full-time security and maintenance personnel living on the grounds. The separation of the units allows sections of the facility to be open at different times by various community groups. This home scale resolves a major situation found in the existing school of who will maintain and develop the facilities. Instead of the board office and the county staff, the users of each house would ideally take over more of the day-to-day operation of the facilities. This includes cleaning, yard work, additions, and light maintenance. The practical life lessons learned in these pursuits fit perfectly into the expanded curriculum over the 300 day school year. Additional funds are generated by the use of the facilities for up to twelve hours each day. The overall goal of integrating the child's activities at school, home, and community is compatible with this human scale architecture.

Different architectural styles have advantages and disadvantages: large windows, courtyard, bay window, open space plans, multistory, stucco, decorative, cedar siding, Gothic arch, dark paneling, skylight, large eaves, wrap-around porch, etc. each give a feel, opportunities,

and control to a place (Soleri, 1983). Exposure to a wide range of elements and forms allows the child to build a pool of experience and knowledge of these advantages and disadvantages. Results of the City Classroom study showed a marked advance in the understanding of construction by the class. In the proposed school facility, dozens of unique architectural and landscape elements will be used to increase the children's understanding of possibilities. The excitement possible with many roof lines, window shapes, corners, porches, and courts is not limited within a single structure. The vantage points, vistas, shade, enclosure, back yards, and complexity are increased 20 times with the alternative presented here. Just as the scale of the buildings is less institutional, the changes extend to the furnishings and floor coverings also. With the addition of bathrooms and kitchens for each room, management of line-up and wait-time is reduced. The experience of being outdoors to play and work is extended by each class having their own grounds. Thus, play equipment and gardens can be personalized.

Meaning is not found or learned, rather it is generated and created by the individual (Phenix, 1974). The sense of place these "home school spaces" give to the young child are closer socially and physically to the places with which they are familiar. The interaction of thirty children for play time, lunch time, and arriving/leaving, time versus that of hundreds of children, creates the feel of conviviality only possible on a small scale.

In review, the five principles of school design which have been incorporated into the proposed model are:

There are messages built into all structures.

Perception depends on one's vantage point.

There is an optimum human scale for all institutions.

Perceptions are led by preconceptions.

We learn the reality to which we are exposed.

Using these principles to design the proposed elementary school results in a diverse, flexible, child centered, ecologically sound, playful, community-based environment. The educational facilities can be inspirational, represent our ideals of beauty, and give many opportunities for the children to explore the diversity of the planet (Barnaby, 1988). The proposed school is a museum of natural history, an arboretum, a mini-farm, a shop, lab, theater, and art studio. The children are able to build their own play environment, thereby keeping it dynamic and meaningful (Allen, 1969). Change is generated by the individual and the class group, not by the dictates of remote administrations. Teachers are able to observe their students, designing a course of study which best fits the learning style and modes of knowing shown by the individual students (Eisner, 1985). The interpersonal, intuitive, aesthetic, and spiritual ways of learning are addressed and accounted for in the activities of the children. The political divisions often seen by the parks department, the school districts, the county officials and the civic groups are eliminated by making the school a community center. The implications of this research go beyond the proposals presented in this prototype school. Age segregation creates an image void for the young child by their having no daily role models of mature

behavior. This lack of images is also the result of separating the children from the operation of the daily life of the community (Dewey, 1915). With the present legal, political, and transportation conditions in this country, changes of these two preconceptions (both segregation by age and location) of how schools should look will need to come from the state or federal level.

The conclusions of this research are that alternatives in school structure elicit creative responses. The changes presented in Chapter Three added play sculptures to the experiences of the students, thus eliciting creative play. The learning environments presented in Chapter Four expanded the scope of the possible to the student's school experiences. In addition to the unique character given to each school by the installations, they created a dynamic physical environment in which to learn. The City work presented in Chapter Five shows that curriculum alternatives are also possible, endorsed by the children, and feasible given the opportunity by administrators. Given the discouraging statistics on the success of the present educational system, alternatives are obviously called for. The environmental awareness of the ecological interaction of all life systems is moving into educational facilities design. When alternatives occur, emphasis needs to be placed on contextual changes in equal shares with the content changes. Use of the design principles presented here direct attention to the contextual changes. The Evaluation Matrix is a map of how comprehensive are the features of contextual changes. Simple, narrow, short term objectives are no longer an option in the design of educational curriculums. In

1915, Dewey wrote of the tremendous flood of information. Calling this flood too much for student or teacher to learn, he called for a change away from the drill and memorization of old facts type-of-schools. In 1991, many elementary schools still operate using this inadequate approach. It is this author's hope that the examples of successful alternative approaches presented here will encourage others to further experiment with the innovative design of learning environment.

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Appendix 1

Selections from John Dewey's Education Today (1940)

My Pedagogic Creed originally published in 1897

The City Classroom, Earthworks, and child built play environments are all based on a belief in the importance of the children entering into a unity of work and thought. Dewey presents the case thus:

-much of present education fails because it neglects this fundamental principle of the school as a form of community life. It conceives the school as a place where certain information is to be given, where certain lessons are to be learned, or where certain habits are to be formed. The value of these is conceived as lying largely in the remote future; the child must do these things for the sake of something else he is to do; they are mere preparations . As a result they do not become a part of the life experience of the child and so are not truly educative.

-the moral education centers upon this conception of the school as a mode of social life, that the best and deepest moral training is precisely that which one gets through having to enter into proper relations with others in a unity of work and thought. The present educational systems, so far as they destroy or neglect this unity, render it difficult or impossible to get any genuine, regular moral training

-under existing conditions far too much of the stimulus and control proceeds from the teacher, because of neglect of the idea of the school as a form of social life.

-the social life of the child is the basis of concentration, or correlation, in all his training of growth. The social life gives the unconscious unity and the background of all his efforts and of all his attainment.

-we violate the child's nature and render difficult the best ethical results by introducing the child too abruptly to a number of special studies, of reading, writing, geography, etc., out of relation to social life.

-the true center of correlation on the school subjects is not science, nor literature, nor history, nor geography, but the child's own social activities (Dewey, 1940, p.p. 7-9).

Each City Classroom has a unique mix of students and thus activities. As in Dewey's Creed, education is conceived as a continuing reconstruction of experience. An active experimental mode is elicited in all the environments presented. Dewey wrote of the dangers of passive, receptive, or absorbing attitudes in education.

-there is, therefore, no succession of studies in the ideal school curriculum. If education is life, all life has, from the outset, a scientific aspect, and aspect of art and culture, and an aspect of communication. It cannot, therefore, be true that the proper studies for one grade are mere reading and writing, and that at a

later grade, reading, or literature, or science, may be introduced. The progress is not in the succession of studies, but in the development of new attitudes towards, and new interest in experience.

-education must be conceived as a continuing reconstruction of experience; that the process and the goal of education are one and the same thing.

-to set up any end outside of education, as furnishing its goal and standard, is to deprive the educational process of much of its meaning, and tends to make us rely upon false and external stimuli in dealing with the child.

-the active side precedes the passive in the development of the child-nature; that expression comes before conscious impression; that the muscular development precedes the sensory; that movements come before conscious sensations; I believe that consciousness is essentially motor or impulsive; that conscious states tend to project themselves in action.

-the neglect of this principle is the cause of large part of the waste of time and strength in school work. The child is thrown into a passive, receptive, or absorbing attitude. The conditions are such that he is not permitted to follow the law of his nature; the result is friction and waste (Dewey, 1940, p.p. 11-13)

From the child-built play sculpture at Kramer Elementary School in Oxford, Ohio to the Map of the United States Forest in Atlanta, Georgia, this research has been about creating images. The entire Surburban School structure and process is also founded on the belief in the power of the image which Dewey refers to thus:

- the image is the great instrument of instruction. What a child gets out of any subject presented to him is simply the images which he himself forms with regard to it.

- if nine-tenths of the energy at present directed towards making the child learn certain things were spent in seeing to it that the child was forming proper images, the work of instruction would be indefinitely facilitated.

- much of the time and attention now given to the preparation and presentation of lessons might be more wisely and profitably expended in training the child's power of imagery and in seeing to it that he has continually forming definite, vivid, and growing images of the various subjects with which he comes in contact in his experience.

- only through the continual and sympathetic observation of childhood's interests can the adult enter into the child's life and see what it is ready for, and upon what material it could work most readily and fruitfully. (Dewey, 1940, p.13).

Dewey goes on to write of the importance of beautiful structures in the schools:

-if we can only secure right habits of action and thought, with reference to the good, the true, and the beautiful, the emotions will for the most part take care of themselves (p.15).

In this section Dewey calls for the artist to come forward to transform the schools. He wrote in 1897 of psychological and sociological science adding insight to education. The City Classroom and the The Surburban School are two examples of the joining of art and science.

-it is the business of every one interested in education to insist upon the school as the primary and most effective instrument of social progress and reform in order that society may be awakened to realize what the school stands for, and aroused to the necessity of endowing the educator with sufficient equipment properly to perform his task.

-education thus conceived marks the most perfect and intimate union of science and art conceivable in human experience.

-the art of thus giving shape to human powers and adapting them to social service is the supreme art; one calling into its service the best of artists; that no insight, sympathy, tact, executive power, is too great for such service.

-with the growth of psychological service, giving added insight into individual structure and laws of growth; and with growth of social science, adding to our knowledge of the right organization

of individuals, all scientific resources can be utilized for the purposes of education.

-when science and art thus join hands the most commanding motive for human action will be reached, the most genuine springs of human conduct aroused, and the best service that human nature is capable of guaranteed (Dewey, 1940, p.16).

Appendix 2
Art Education, Earthworks article

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(Below) With intense concentration, primary grade children created many miniature structures representing their imaginary worlds. (Right) No shoes, no workbooks, no teachers—just continuous, spontaneous interaction with clay. (Below right) Bridges with dark shadows, tunnels and holes, holes and trenches represented the hundreds of scenarios played out in the depths of the earth.



Earthworks: A Two-Hundred-Ton Art Educational Media

Robert D. Clements
and
Lawrence Stueck

The principal helped us choose the site. A back hoe came out and dug a 200 foot trench, four feet deep and eight feet wide. With the loose dirt piled on either side, the children constructed, during art class, gym class, and free play time. Bringing shovels on the school bus and wearing old clothes, they spent two wonderful weeks digging and building roads, tunnels, holes, hills and trenches.

In the Earthworks, the students worked both from intrinsic motivation and for intrinsic purpose. They themselves designed and directed the construction. When asked, parents and children alike felt that children's excitement at going to school more than com-

pensated for the trouble of washing dirty clothes and the loss of classroom learning. Younger children brought their Tonka bulldozers, graders, and steam shovels, to build the structures of their personal fantasies. Upper elementary level children, in the gang age, worked together with real shovels to build monolithic structures: the longest trench, the deepest hole, the highest hill.

Three-dimensional manipulation is a crucial skill: art helps people move from the abstract to the concrete, and back again. Even more so as our culture becomes increasingly electronic and information becomes more abstract, human lives will become ungrounded; human purpose will become dematerialized; and "reason-to-be" will slip away from many. Art can humanize existence and add sensitivity to the physical world. For art deals with both the abstract and the concrete world.

Five hundred children's unique

scenarios all took place in an area 200 feet by 100 feet. The constructions were often comfortably parallel, but, on occasion and with much consternation, overlapping. After two glorious weeks of this First Annual Earthworks, the pelting rain and thousands of thundering footfalls rendered the earth impenetrable to plastic shovels. The kids went on to other materials. The gigantic Earthworks, now silent, lay waiting to be used again, the memory never to be forgotten. ■

Robert Clements is professor of art at the University of Georgia. Lawrence Stueck conceived and directed this project at Barnett Shoals Elementary School, Athens, Georgia, under principal Jack Benton. Stueck is completing his M.F.A. degree in sculpture at the University of Georgia.

Appendix 3
School Arts, Playground article

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Special students / a special playground

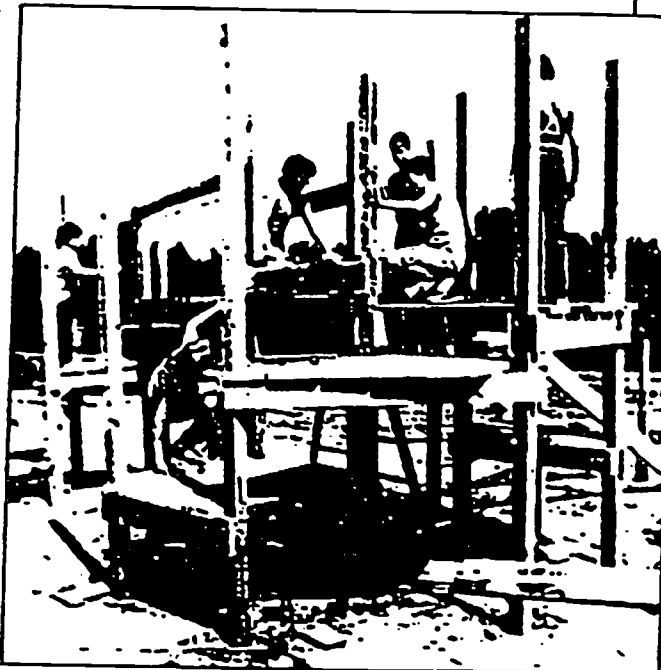
The players built the playground. Sixteen fifth-grade boys in a special education class built a playground for their rural elementary school in just two weeks. Most of the boys had one or more handicaps, such as mental retardation, behavior disorders, cultural deprivation or learning disabilities. When these boys, who had failed at most school assignments, planned and built their playground, they gained a new sense of self-confidence.

First, the boys planned and ordered the materials. Lumber and hardware worth \$2,000 was furnished by the P.T.A. and the School Board. They determined the locations of the holes, dug the holes and set the poles for the play structures. Then they bolted the posts, notched the posts, nailed the decking and sanded the handrails.

For the special youngsters who constructed it, the playground was a three-dimensional learning environment, not only afterwards, but especially during its construction. When students used a tape measure, fractions became useful realities when they tightened bolts, engineering stresses became safety considerations, when they drove a nail, angles of force became efficiency factors. These skills will remain useful throughout their lives.

The children manipulated the world of three dimensions. This was unlike the usual two-dimensional paper-and-pencil exercises taught in most schools. Children are usually denied opportunities to conceive concretely in three dimensions. Is it any wonder, then, that we are surrounded by unimaginative, badly designed homes and public buildings?

If children are to grasp the connections between the mental and the physical, and to learn to look closely and critically at their environment, they must be taught to think in three dimensions. For children like the ones who built this playground, the purpose of this kind of work is obvious: the result is concrete and real interest soars — and ultimately, society benefits — when children are given the power to make changes in their physical world.



Lawrence Sauer is a designer and sculptor who has built sixty learning environments for schools, parks, museums and universities in Georgia, South Carolina, Alabama, Arkansas and Ohio. This is one of several environment projects he has directed for special education populations. Robert D. Clements teaches Art for Exceptional Children in the Art Department at the University of Georgia.

Appendix 4
City Classroom Release form

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Consent Form

I give my consent for _____ to participate in the research entitled, The City Classroom Evaluation, which is being conducted by Lawrence Stueck 769-7729. I understand that this participation is entirely voluntary; I or my child can withdraw consent at any time without penalty and have the results of the participation, to the extent that it can be identified as my child's, returned to me, removed from the experimental records, or destroyed.

The following points have been explained to me and my child:

- 1) The reason for the research is to evaluate the "city" curriculum.

The benefits that I may expect from it are a record of the classroom activity.

- 2) The procedures are as follows: between 1/18/90 and 5/15/90 Lawrence Stueck will be observing during school hours the class of Mrs. Dolly Davis.

- 3) The discomforts or stresses that may be faced during this research are: None

- 4) Participation entails the following risks: None

- 5) The results of this participation will be confidential and will not be released in any individually identifiable form without my prior consent unless required by law.

- 6) The investigator will answer any further questions about the research, either now or during the course of the project.

signature of investigator

signature of parent(s) or guardian(s)

Please sign both copies. Keep one and return the other to the investigator.

Research at The University of Georgia which involves human participants is carried out under the oversight of the Institutional Review Board. Questions or problems regarding these activities should be addressed to Ms. Heidi L. Roof, Coordinator, Human Subjects Research, or Dr. J. B. Jones, Director, Institutional Review Board, Office of V.P. for Research, The University of Georgia, 604A Graduate Studies Research Center, Athens, Georgia 30602, (404) 542-6514 or 542-593

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